

THE
EXPLANATION
OF THE
Frontispiece.

First cast your eye upon a Rustick Seat,
Built strong and plain, yet well contriv'd, and neat,
And situated on a healthy Soyl,
Yielding much Wealth with little cost, or toyl.
Near by it stand the Barns fram'd to contain
Enriching stores of Hay, Pulse, Corn, and Grain;
With Bartons large, and places where to feed
Your Oxen, Cows, Swine, Poultry, with their breed.
On th'other side hard by the House, you see
The Api'ary for th' industrious Bee.
Walk on a little farther, and behold
A pleasant Garden from high Windes and Cold
Defended (by a spreading, fruitful Wall
With Rows of Lime, and Fir-trees streight and tall,)
Full fraught with necessary Flow'ers and Fruits,
And Natures choicest sorts of Plants, and Roots.
Beyond the same are Crops of Beans and Pease,
Saffron, and Liquorice, or such as these;
Then Orchards so enrich'd with fruitful store,
Nature could give (nor they receive) no more,
Each Tree stands bending with the weight it bears
Of Cherries some, of Apples, Plums, and Pears:
Not far from thence see other Walks and Rows
Of Cyder-fruits, near unto which there flows
A Gliding Stream; the next place you discover
Is where St. Foyn, La Lucern, Hops, and Clover
Are propagated: Near unto those Fields,
Stands a large Wood, Mast, Fewel, Timber yields.
In yonder Vale hard by the River stands
A Water-Engine, which the Winde commands
To fertilize the Meads, on th'other side
A Persian Wheel is plac'd both large and wide
To th' same intent; Then do the Fields appear
Cloathed with Corn, and Grain, for th' ensuing Year.
The Pastures stockt with Bealts, the Downs with Sheep,
The Cart, the Plough, and all, good order keep;
Plenty unto the Husbandman, and Gains
Are his Rewards for's Industry and Pains.
Peruse the Book, for here you onely see
Th' following subject in Epitomy.

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Sould By Samuel Speed Neere y^e Inner Temple Gate In Fleetstreete. A^o 1666

1. Continence

Systema Agriculturæ,

The MYSTERY of HUSBANDRY DISCOVERED;

Wherein is Treated of the several new and most
advantagious Ways

Of

TILLING PLANTING SOWING MANURING ORDERING IMPROVING	} All sorts of	GARDENS, ORCHARDS, MEADOWS, PASTURES, CORN-LANDS, WOODS, & COPPICES.
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And of all Sorts

Of

FRUITS, CORN, GRAIN, PULSE, NEW HAYS,	} CATTEL, FOWL, BEASTS, BEEES, SILK-WORMS, &c.
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With an account of the several *Instruments* and
Engines useful in this Profession,

To which is added,

KALENDARIVM RUSTICVM,

OR,

The Husbandmans Monthly Directions.

ALSO

The Prognosticks of Dearth, Scarcity, Plenty, Sicknes, Heat, Cold,
Frost, Snow, Windes, Rain, Hail, Thunder, &c.

AND

Dictionarium Rusticum: Or, The Interpretation of Rustick Terms.

Published for the Common Good, by J. W. Gent.

The whole Work being of great Use and Advantage to all that
delight in that most noble Practice.

Virgil. *O fortunatos nimium, sua si bona norint,
Agricolae*-----

LONDON: Printed by T. Johnson for Samuel Speed, near the
Inner Temple Gate in Fleet-Street. 1669.

Thom Tanner. 1713

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17. 11. 1898.

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TO THE
GENTRY and YEOMANRY of England.

SIRS,



O you is Dedicated this succeeding *Traſt*, and for your ſakes principally doth it ſubmit it ſelf to the Censure of this *Critick Age*, Its a bad time for ſo mean and *Ruſtick* a Subject to appear, when every *Shop* and *Library* is replete with the *Fruits* and *Labors* of the moſt *Acute Wits*. Yet I hope with you it will obtain its end, in this opportune ſeaſon, when by the great Plenty, and ſmallneſs of Value of the *Ordinary Productions* of the *Earth*, ſo many of your *Tenants* exerciſed in onely the *Vulgar Methods* of *Agriculture*, are forced to withdraw their hands from the *Plough*, and revert their *Tenements* into your own poſſeſſions, that you your ſelves may cultivate that which is your own; and you that continue in your *Farms* may by your *Induſtry* manage them after the beſt and moſt advantagious Ways for the propagating of ſuch things, that we are moſt deficient of, and that may moſt retaliate your *Coſt* and *Induſtry*, and moſt improve your *Lands*, not onely for the benefit of your *Selves* and *Poſterity*, but the *Kingdom* in general. The ſeveral ways and means to accompliſh the ſame being here preſented to your view; For which end and no other, theſe *Experiments & Observations* have bin not with a little care, compoſed and contracted into ſo convenient and brief a *Method*, and in ſuch a *familiar ſtyle*, ſuitable to the apprehenſions of thoſe they moſt concern; That they may answer your expectations is the deſire of

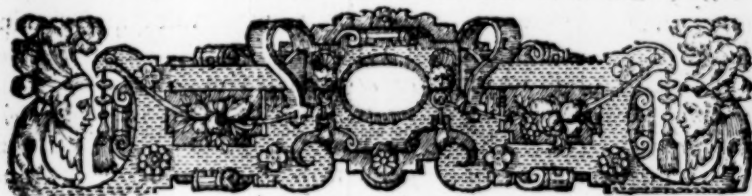
J. W.

Virgil.

————— *Laudato ingentia Rura,
Exiguum ſolito.* —————

A TABLE of the CHAPTERS
contained in this Treatise.

- I. **O**F Husbandry and Improvements in general, plainly discovering the Nature, Reasons, and Causes of Improvements, and the Growth of Vegetables.
- II. Of the great benefits and advantages of Enclosing Lands.
- III. Of Meadow and Pasture Lands, and the several ways of their Improvements, either by Watring or Drowning, or by Sowing or Propagating several sorts of extraordinary Grasses, Hayes, &c.
- IIII. Of Arable Land and Tillage, and of the several Graines, Pulses, &c. usually Propagated by the Plough.
- V. Of the Manuring, Dugging, and Sowing of Land.
- VI. Of the benefit, raising, planting, and propagating of all sorts of Timber-trees and other Trees useful either in Building, or other Mechanick uses, or for Fencing, Fuel, &c.
- VII. Of Fruit-Trees.
- VIII. Of such Tillage, Herbs, Roots, and Fruits, that are usually Planted and Propagated in Gardens, and Garden Grounds, either for necessary food, use, or advantage.
- IX. Of several sorts of Beasts, Fowls, and Insects, usually kept for the advantage and use of the Husbandman.
- X. Of common and known external Injuries, Inconveniencies, Enemies, and Diseases incident to, and usually afflicting the Husbandman in most of the Ways or Methods of Agriculture before treated of; And the several Natural and Artificial Remedies proposed and made use for the prevention and removal of them.
- XI. Of the several sorts of Instruments, Tools, and Engines incident to this Profession of Agriculture; And of some Amendments and profitable Experiments in Building, either by Timber, Stone, Brick, or any other way.
- XII. Kalendarium Rusticum : Or, Monethly Directions for the Husbandman.
- XIII. Of the Prognosticks of Dearth, or Scarcity, Plenty, Sicknes, Heat, Cold, Frost, Snow, Windes, Rain, Hail, Thunder, &c.
- XIV. Dictionarium Rusticum : Or, The Interpretation of Rustick Terms, &c.



PROOEMIUM

In Laudem Agriculturae,

BEING

The *Preface* or *Introduction* to the WORK,

Shewing the Excellency, Utility, and Necessity of *HUSBANDRY*.

THIS is an Age wherein to commend or extol an ingenious Art or Science, might be esteemed a needless Labour, especially in a Countrey so highly improved in every thing; But that we finde the more noble, advantageous, useful or necessary any Art, Science, or Profession is, the stronger Arguments are framed against it, and more particularly against this *Rustick Art*, and its infinite Preheminencies and Objections, by the vainer and more *Pedantick* sort of persons, despising the worth or value of what they are ignorant of, who judge it below their Honour or Reputation, to take any notice of so mean a Profession; that esteem the Countrey no other than a place for Beasts, as Cities for Men; This makes us tread in the steps of more worthy *Rustick* Authors, and give a short Preface, not to seek credit of the Envious, but to satisfie or confirm the Ingenious of the excellency and inestimable value of this Art, not onely for the exercise and health of our Bodies, the encrease of our Fortunes, and our universal benefit, use, and advantage: but also for the tranquility and peace of our minds, and improving our understandings, which they will assuredly finde doth proceed from such noble, pleasant, and necessary *Enterprises*; If they diligently read and peruse the Ancient Writers, they may observe that many wise and learned Men, worthy of praise were exceedingly delighted, not onely in a *Rural* Habitation, but did also exercise themselves in Tilling the Earth; That the study of *Agriculture* was of so high an esteem, and so worthy of honour, that *Poets*, *Philosophers*, *Princes*, and *Kings* themselves, did not onely acquire an honourable and an

The Preface.

immortal name, by their Writings and Precepts in this Art left to Posterity; But have also diligently performed the Office of a Countrey-man, and wrought with their own hands, and obtained thereby not a little fame and renown; for which cause, *Xenophon* in his elegant Tract of *Oeconomicks* tells you, *That nothing can be of a more Regal (or noble) estimation and splendor, than judicious Agriculture*; *Socrates* also gives you a relation, how *Cyrus* that most renowned King of *Persia*, a man of a sublime Wit, and most illustrious fame, when *Lyfander* of *Lacedemonea*, a man endowed with excellent vertues, came and brought him Presents, at a certain time for their recreations he conducted *Lyfander* into his Garden, on every side inclosed with a noble Fence, and Cultivated with most curious Art, and singular Industry; Then *Lyfander* (admiring the compleat order of every thing, and the height of the Trees, planted in such direct lines, and every way lineal or prospective, the Earth adorned with Plants, the fairness of the Fruits, the beauty and order of the pleasant and fragrant Flowers) said, that he did exceedingly admire not so much at the study and diligence, as the Industry and Ingenuity of the Workman, by whom the same was so Artificially ordered and contrived; Then *Cyrus* being well pleased with the praise and commendation of his workmanship, answered *Lyfander*; All these things were performed by my own Industry, these curious Orders were by me delineated, these Trees, Plants, Flowers, and all these things thou so admirest at, were all planted and performed by my own hands; Then *Lyfander* beholding his Purple Habit, the excellency of his person, and his *Persian* Ornaments glittering with Gold and precious Stones, said: O *Cyrus*, how deservedly may you of all Men, be esteemed happy, seeing so high an Honour and Fortune, is conjoynd and united with so excellent a spirit.

Pliny writes, that the Romans had so high an esteem for Agriculture, that their Laws did extend to the Reformation of the negligences, and abuses in the exercise of that necessary and honorable Art. The same Author brings several Presidents of many worthy and honorable Persons that addicted themselves unto, and affected this Art, and highly sets forth the praise and commendation thereof, and shews how the ancient Romans did execute their Rustick Laws, and encouraged the Industrious and Ingenious Husbandman, as by the Example of *C. Furius Crespinus*, who out of a small piece of Ground, gathered much more Fruits and Profits, than his Neighbours about him, out of their great and ample Possessions, which highly contracted their envy and hatred against him, insomuch as they accused him of that by Sorcery, Charms, and Witchcraft, he had transported his Neighbours Fruits, Fertility, and Increase, into his own Fields; For which he was ordered by *Spurius Albinus*, peremptorily to answer the matter, he therefore fearing the worst, at such time as the Tribes were ready to give their voices, brought into the common place his Plough, and other Rural Instruments belonging

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“longing to *Agriculture*, and placed them in the open face of the
“Court; He set there also his own Daughter, a lusty strong lass
“and big of Bone, well fed, and well clad, also his Oxen full and
“fair; Then turning to the *Citizens of Rome*, *My Masters* (quoth
“he) these are the Sorceries, Charmes, and all the Inchantments
“that I use, I might also alleadge mine own travel and toyl, my
“early rising and late sitting up, and the painful sweat I daily en-
“dure: but I am not able to present these to your view, nor to
“bring them with me into this assembly; Which when the People
“had heard, they unanimously pronounced him not guilty, and
“he was highly commended of all Persons for his Ingenuity, and
“Industry.

It is most evident that this Art of *Agriculture* doth not require
so great charge and expence as it doth Judgement, Labour, and In-
dustry, which to possess men withal, and encourage them unto,
is the intent and scope of our Learned, both Ancient and Modern
Authors, that we may not spend the best of our times in the most
vain, costly, unnecessary and trifling studies and affaires; For in
former times (*Cato* testifies) he was highly commended and praised
that was esteemed a good Husband; It cannot be thought that so
learned and wise Men could set so high a value and esteem upon
this Art of *Agriculture*, but upon very solid and weighty grounds
and reasons: Not to speak of the various delights, pleasures, and
contents, that these *Rusticities* plentifully heap upon us, they
supply us for our necessities, and advantages, for without this
Art none in *City* or *Countrey* could subsist, as the Mother suckles
the Infant with her Milk, so doth the Earth the Mother of us all
universally feed and nourish us at an easie, liberal, and profitable
rate, whereof we have daily experience, that our Industry, La-
bour, and Costs, are returned upon us, with a manifold increase
and advantage; unless the *Celestial* influences impede; *Chrysostom*
also shews how necessary the Art of *Agriculture* is (when enu-
merating the several advantages of *Mechanick Arts*) at length con-
cludes that this Art is by far more worthy, excellent, and neces-
sary; than all the other: we all know how ill we can subsist with-
out Garments and other necessities of that nature; But without
the Fruits and other increase of the Earth we cannot live. The
Scythians, *Hamaxobians*, and *Gymnosophists*, esteemed all other Arts
as vain and unprofitable, but this Art of *Agriculture* they accoun-
ted the onely necessary for human life, they exercised and appli-
ed all their Industry, Ingenuity, Practises, and studies, principal-
ly to this onely Art.

Romulus and *Cyrus* knowing the necessariness and usefulness of
this Art, above all other exercises and Arts, did first institute or
introduce their subjects in *Military* affaires and *Agriculture*, judg-
ing these onely sufficient to preserve and defend them from the in-
juries of others, and to sustain their lives: we also read that the
Helvetians or *Switzers* a very wise people in their management of
affaires, inhabit or possess about one hundred Towns, out of
which they yearly send a thousand chosen men into their Army,

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Pliny.

the rest remain behind to till the Ground, the next year those of of them that staid, go forth to the War, the other return; By which means they are as well exercised in War as in Husbandry: it is also noted of *Romulus*, that he used to preserve *Husbandmen* above *Citizens*, esteeming those that lived in Towns, with their wealthy Stocks and Trade not equal, nor worthy of compare with those that tilled the Land, and wearied themselves daily in *Rustick* exercises. The *Romans* when they gave names to their Tribes, called the chiefest of the States, the *Rustick Tribes*, and the meaner in degree, the *Urbane*.

Sylva

Numa Pompilius to encourage *Agriculture*, commanded the Fields to be divided into a certain number of Villages, in each of which he constituted a Supervisor, whose principal office it was to observe and enquire, who diligently and industriously till their Land, and who neglected it, whose names were brought unto him, he often times called for the Industrious Husbandman, and courteously received him, and sometimes dismissed him with noble *Gratuities*, and contrariwise the idle and sloathful he rebuked, whereby some for fear of shame and disgrace, the rest in hope of favour and reward, they were all continually intent on their affairs, that they might render themselves, and their Lands praiseworthy to their King; A worthy and noble President for the encouragement of our English *Husbandmen*, that are Ingenious and Industrious, and for the regulation and reformation of the infinite abuses, injuries, and neglects, so frequently committed and suffered in every Village, by the sloathful, ignorant, and envious *Rustick*; The like examples we finde to be in several Countreys, as *Spain*, *Germany*, *Venice*, *Holland*, &c. of compulsive Laws, and excellent Customes for the propagation of Trees for Timber, and for Fruits. In *Burgundy* where Walnut-Trees abound, when ever they fell a Tree, they always plant a young one neer him, and in several places betwixt *Hanaw* and *Francfort* in *Germany*, no young Farmer is permitted to marry a wife till he bring proof that he hath planted, and is a Father of such a stated number of Walnut-Trees, which Law is inviolably observed to this day; It hath been a long time designed, and attempted by several worthy Persons, Affectors of Ingenuity, and the publick good of the Kingdom, that there might be some Constitutions or Orders for the advancing and propagating of this noble Art, especially that part relating to the increase and preservation of Timber and Fruit-Trees, and that there might be judicious and experienced Supervisors in every place for that purpose: we must needs confess we have several good Laws relating to our Rural affairs, but none more slighted nor neglected than those; our hopes and expectations, are now great, that something will shortly be done therein, seeing that *Royal and most excellent Society* at *Gresham Colledge*, make it one of the most principal objects of their studies and care; it being so universally necessary for our well-being and preservation, if not the most necessary, all things considered.

Maximus Tyrius a most grave *Philosopher*, composed a Dialogue, wherein

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wherein with many sufficient and firm Reasons, he demonstrates that this Art of *Agriculture* hath the precedency of, and is more necessary than the *Military*, and elegantly and learnedly discutseth many things, and very much of the profits and advantages of the *Rustick Art*, and *Rural* affairs.

As to its antiquity, no Art or Science can precede it, every one knows that a Countrey life was the most ancient, and that men did in the infancy of time inhabit in Countrey Habitations, and sustained themselves by the Fruits of the Earth, and dwelt in Tents, Woods, &c. in stead of Houses.

As to the state, qualification, and condition of a Countrey life, we may confidently maintain, that it far excels the City life, and is much to be preferred before it. *Plato* affirms that a Countrey life is the Mistress, and as it were the Pattern of diligence, justice, and frugality, that he could finde nothing more profitable, pleasant or grateful, than to live in the *Countrey*, remote and free from envy, malice, calumny, covetousness and ambition, which occasioned this grave Author to ordain several peculiar Laws, relating to this noble Art, which were brought unto and confirmed by the Emperor *Justinian*, &c. *Cicero* discoursing of the utility of several Arts, at length concludes that of all things necessary and useful, nothing is better, more advantageous, stable, pleasant, nor more worthy a noble and ingenious spirit, than *Agriculture*, &c. *Virgil* also had as high an esteem thereof, and did very much extol and celebrate this *Rustick Art*, in so much that when he was almost lost amongst the pleasant Groves, and ruminating on the Felicities the Country yielded, he brake forth into this expression.

*O Fortunatos nimium, sua si bona norint,
Agricolae; quibus ipsa procul discordibus Armis
Fundit humi facilem victum iustissima tellus.*

And *Horace* in a certain Ode sings thus.

*Beatus ille qui procul negotijs,
ut prisca gens mortalium,
Paterna Rura, bobus exercit suis,
solutus omnisanore, &c.*

Also hear the Divine *Du Bartus* in his Commendations of *Husbandry*.

*O thrice, thrice happy he who shuns the Cares
Of City troubles, and of State affaires,
And serving Ceres tills with his own Teem,
His own Free-land left by his Friends to him.*

The Pleasures and Oblectations are superabundant and infinite, which we daily enjoy and receive from the Verdant Fields and Meadows, from the sweetness and beauty of the Flowers, the springing Woods, the delicate Fruits, and the variety of domestic

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meestick and pleasant Animals, educated even to the very hand, and from the various and harmonious Notes of the *Nymphs* of the Woods.

*The winged fancies of the learned Quill
Tell of strange wonders, sweet Parnassus Hill,
Castalia's Well, the Heliconian Spring,
Star-spangled Vallies where the Muses sing.
Admired things another storie yields,
Of pleasant Tempe and the Elysian Fields;
Yet these are nothing to the sweet that dwells
In low built Cottages, and Countrey Cells, &c.*

We may well admire at such as are not highly delighted at the Prospect of the most of our Countrey Villages, whose beauty and lustre daily encrease (where their Inhabitants are Industrious) and appear more and more neat, adorned, and enriched, and in every part yields innumerable of pleasant and fruitful Trees; Can there be a more ravishing & delightful object, than to behold the Towns planted with Trees in even lines before their doors, which skreen their habitations from the Wind and Sun, where they may sit or walk under the dark shaddows of the Woods and Groves, and where are always the glyding streams, most cleer and bright *Rivers*, pleasant Hills, and shaddowy Vallies, delightful Meadows, and many other the like Oblectations?

Du Bartas.

*Fair, firm, and fruitful, various, patient, sweet,
Sumptuously cloathed in a Mantle meet,
Of mingled Colour, lac't about with Floods,
And all embroydered with fresh blooming Buds.*

That the highest and most absolute Content any man enjoys or findes in any sublunary thing, is in this Science of *Agriculture*, and the severall Branches and Streams of pleasure and delight, proceeding or flowing therefrom, none but such as are ignorant thereof will deny; Of such that affirm it, we could produce infinite of Testimonies, also of many that so highly affected this Art and Life, that they deserted their *Powers, Dignities, Kingdoms, Victories, and Triumphs*, and wholly applyed themselves to *Agriculture*, and a *Rustick* Habitation, some whereof we shall here instance, as *Manlius, Curius, Dentatus*, who after he had not onely conquered the warlike King *Pyrrhus*, but had expelled him out of all *Italy*, and had three severall times triumphed with glory and renown, and had very much enlarged the *Roman Empire* by his honorable Atcheivments, returned with infinite affection, and very joyfully to his former Exercises and *Rusticities*, and there concluded the residue of his days with much tranquility of minde and rest: No less delight did *L. Quintus Cincinnatus* take in that Countrey Life, who when he was called by the *Roman Senate* to the *Dictatorship* (an Office of very high dignity), was found at Plough in a rude and dirty habit

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habit or condition, in his little Farm, and after he had obtained his freedom from the Office, he immediately returns to his Rural Occupations.

Also *Attalus* that rich *Asian King*, who left his Regal Dignity, and resigned his *Empire*, was then so intent on *Agriculture*, with such incessant care and diligence, that he formed, planted, and contrived several peculiar Gardens, by his own singular Ingenuity and Industry; We must not omit *Dioclesian* the *Emperor*, who left the troublesome Empire, and affecting a private life, betook himself to the Countrey, and there lived a long time, and enjoyed the experience, and reaped the Fruits of most pleasing tranquillity, and happy rest; and although that he were oftentimes invited and solicited by Letters and Embassadors from the *Senate*, to return again to his Empire, yet could he never be tempted away from his beloved Village.

We read also of that most excellent person *Attilius Calatinus*, who for his singular Vertue was called from the Plough and Harrow to be a *Dictator*, yet still so persisted in his pleasing Frugality and Parsimony for the great love he bare to *Agriculture*, that he rather chose to live privately in the Countrey, and to weary himself with digging and ploughing his Land, than to be a Prince of the *Romans*, and possess the highest place amongst the *Senators*.

And likewise of *Abdolo Nymus*, who from a poor Gardiner (yet of Princely race) was chosen to the Crown of *Sidon*.

Noah the just, meek Moses, Abraham
(Who Father of the Faithful Race became)
Were Shepherds all, or Husbandmen at least,
And in the Fields passed their days the best:
Such were not yest, Attalus, Philemetor,
Archelaus, Hiero, and many a Pretor,
Great Kings and Consuls, who oft for blades
And glistering Scepters, handled Hooks and spades;
Such were not yest, Cincinnatus, Fabricious,
Serranus, Curius, who un-self-delicious,
With Crowned Coulters, with Imperial hands,
With Ploughs triumphant ploughed the Roman Lands.

Dr BARNES

How much honour were *Piso*, *Fabius*, *Lentulus*, and *Cicero* worthy of, who invented and brought into use the commodious way of sowing of the several Pulses that from that time have born their names? We must not forget our famous and most Ingenious Countrey-man, the *Lord Verulam*, a Person who though much concerned in the Publique affairs of the Kingdom, yet spent much of his time and studies in the diligent scruting into the nature and causes, and proposed means for the Advancement and Propagation of this part of Natural Philosophy as his *Sylva*, and several other of his Works testify.

Many other Examples of this nature might here be inserted; But these, together with the Multitude of the like Presidents our
pre-

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present Age and Countrey affords us, as well of the Industrious and most judicious operations of our Nobles and Gentry, in these Rusticities, as of their noble and pleasant Palaces, and Rural Habitations, and the contentments and delights they place in them, may be sufficient to convince all ingenious Spirits, that are not prejudiced against this Art, not onely of the dignity, pleasure, and oblectation thereof, but of its utility and necessity.

Here they enjoy all things necessary for the sustentation of Life, and are freed from the perturbations, cares, and other troubles, that in other places disturb the mind; and live content with their lot, in tranquility, and moderation of spirit: Here is

*Secura quies, et nescia fallere Vita,
Dives opum variarum, ———*

This Countrey life improves and exercises the most noble and excellent parts of our Intellects, and affords the best opportunities to the Insatiable humane Spirit, to Contemplate and Meditate on, and to penetrate into, and discover the obscure, and hitherto occult Mysteries and secrets of Nature; The fixity, or mobility of the Earth; the nature of the Air; its weight and divers mutations, the flux and reflux of the Sea, the nature and matter of Comets, Meteors, &c. the Mystery of Vegetation, the nature of Animals and their different Species, the discovery and improvements of Minerals, and to attain the highest perfections in Science and Art, yea this condition capacitates a man to the study and practise of the most Secret and Mystical things Nature affords, if adapted thereunto.

That there is no place so fit for such study or contemplation of Natural Philosophy, or any of the Liberal Arts, *Plato* the Prince of Philosophers testifies by his deserting *Athens*, that splendid City, and erecting his *Academy* in a Remote and Rustick place, also *Petrarchus* for the quieterude and solitariness of that kind of life, was so much delighted therewith, that he most pleasingly spent those years he lived, alone in a secret Valley, which caused him so often to invite his Friends, to come and enjoy with him the Contentments of so happy and grateful a Countrey Life, as it appears by many of his Epistles; you will also finde that all studious and learned men, have exceedingly delighted in a Solitary and Rural Habitation, and to have much preferred it; For besides the serenity of the Air, and the pleasing Viridity, which much quickens the Genius, it is most certain that the spirits also are thereby recreated, and the Intellectual parts wonderfully accuated, as the same *Petrarcha* says,

*Hic non Palatia, non Theatra, nec atria,
Sed ipsorum loco Abies, Fagus, & Pimis,
Inter herbus virescentes, & pulchrum montem vicinum
Unde & Carmina descendunt, & Plurima,
Attolluntque de terra, ad sidera nostram mentem.*

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By which it is most apparent, that the study of Arts and Sciences, and the exercise and fruition of a Countrey life, are of so near a resemblance, that they may both be practised without impeding each the other.

This *Rustick* Life also most certainly hath the preheminance above the Habitations in great Towns, Cities, &c. For that it yields a perpetual Rotation of its infinite variety of oblectations and contents, as the various times and seasons of the year, with a pleasing face successively present themselves, sometimes the *Spring* approaches the most certain fore-runner of the *Summer*, all Trees then exercising, as it were a mutual emulation, which should be arrayed with the most verdant Leaves, and adorned with the most excellent and curious Blossomes that they afford (besides most fragrant Odors every way breathing from them) incredible delight and pleasure to all; to these may you add the pleasant Notes of the Chanting *Nymphs* of the Woods, singing their Amorous Ditties, ravishing our Ears with their sweet harmony; Then follows the *Summer* adorned with various Flowers, the Lilly, the Rose, the Gilliflower, and infinite other most curious and pleasant, and also several delightful Fruits, Animals, and other necessities for humane use; then also succeeds the *Autumn* or Harvest wherein we reap the Fruits of our past Labours, then doth the Earth discharge it self of its infinite variety of its Grain and Pulse, and the Trees of their delicacies, then also doth the Air begin to wax cool, to recollect and refresh our spirits before debilitated with too much heat; at length enters cold *Hyems*, which of all the rest conduces most to the health of our bodies; for then our superfluous humours are with cold compressed or else concocted, and the natural heat being the more concentrated, renews its power, and more easily performs digestion, and expelling obnoxious humours, as Philosophers say, Powers united are of greater force than dispersed, so then are we more firm, active, and strong, the end of *Winter* gives a beginning to the subsequent Spring, *Annus in Angue latet*, so are the Rural pleasures and oblectations renewed *ad infinitum*.

The *Heathens* of old had also a very high esteem of *Agriculture*, as appears by their several *Gods* and *Goddesses*, whom they judged had a tutelar care over those Fruits of the Earth, and other things under their tuition, as *Bacchus*, *Ceres*, *Diana*, *Saturn*, *Flora*, *Pales*, and several others, but leaving them, we finde many learned men of profound parts, and most excellent ingenuity to have taken delight, and to have been very studious of this Art, as *Cicero*, who so highly effected and esteemed these Rusticities, that (amongst several other *Rural* Habitations, wherein he took much delight) was so well pleased with the pleasant scituation of the *Tusculan* Fields or Countrey, he there instituted as it were another *Academy*, and composed those Philosophical Questions, which

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from the place he named *Tusculan*; *Cato* the Roman *Censor* and excellent Moralift was wont to say, that placed his whole recreation and the universal tranquility of his minde in the exercise of *Rural* affairs, therefore with infinite of pleasure and affectation did he inhabit in the Village *Sabine*, positively affirming that a better and more pleasant life was not to be found; *Seneca* also was of the same opinion, that he could tarry in no place more willingly than in his own Village, into which with a very great Art he brought an Aquaduct to water his Gardens; what shall we say of *Varro*, *Palladius*, and *Columella*, who published so many useful and profitable Precepts of *Agriculture*, and so industriously exercised and delighted themselves in a *Rustick* life? We might produce many more instances of most honorable, learned, and worthy Persons, who rather elected and preferred to spend their remaining days in the Countrey, than in the most pompous Palaces and Cities, but that we judge it needless; such that desire to hear more, we refer them to *Pliny*, and other Authors more Copious in Historial Relations.

It is for no other reason that *Gardens*, *Orchards*, *Partirres*, *Avenues*, &c. are in such request in *Cities* and *Towns*, but that they represent unto us Epitomized, the Form and Idea of the more ample and spacious pleasant *Fields*, *Groves*, and other *Rustick* objects of pleasure; formerly *Gardens* were not in *Cities* and *Towns*, but in Villages without, as *Pliny* witnesseth, until *Epicturus* (the Doctor and Master of pleasure and voluptuousness) first planted them in *Athens*, which was afterwards imitated and brought into use by such who loved their pleasures; *Gardens* wherever planted, were always in esteem, as the famous *Gardens* of *Adonis* & *Alcinous*, and those *Horti Pensiles* of *Semyramis* Queen of *Babylon*, or *Cyrus* King of *Assyria* elevated so high from the Earth, on *Terraces* and other *Edifices*, that they were numerated amongst the most stupendious and wonderful Works that were in the World; Also that renowned fictitious Garden of the *Hesperides*, *Hyeroglyphically* and *Philosophically* representing unto us the Summary of eternal Atchievements or Enjoyments; The *Romans* also made great store of *Gardens*, and placed great pleasure in them: we must not forget the singular Care and Industry of the *Egyptians* in tilling their *Gardens*, wherein, by reason of the temperature of the Air, the goodness of the Earth, and their exquisite Industry, flourish and grow throughout the year, the green Herbs and infinite variety of pleasant Flowers; How many rare and excellent *Gardens*, and places allotted and designed for pleasure are in every part of this Kingdom, and in our neighboring Countreys: but more especially in renowned *Italy*, the Garden it self of the World? The great study, care, ingenuity, cost and industry, bestowed and employed about them, are arguments sufficient to convince the greatest Antagonist of the infinite contentment and delight they had, and enjoyed in *Agriculture*, and those kinde of
Rural

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Rural exercises, the commendations whereof the great advantages, oblations, and its universal uses and pleasures are so many and too tedious here to enumerate, that they require an eloquent Pen, and an expert hand to discover their worth, and not to be crowded into so narrow a confine as a Preface: more you may read in several Authors of its praise, practise, and worth, as *Horace* in several of his Poems hath written in the praise of *Agriculture* and a *Countrey life*; in *Tibullus* also you have one of his Elegies full of praises and delights of a *Countrey life*; So also *Angelus Politianus* his *Sylva Rustica*, and *Pontanus* his second Book de *Amore conjugali*; also *Cicero* in his Book de *Senectute* writes in praise and commendation of the *Countrey* and of *Agriculture*, where he says in one place, *Venio nunc ad voluptates Agricolarum quibus ego incredibiliter delictor*, &c. *Du Bartas* also in his divine Poems, omits not the Praise of this as most Praise worthy; but *Virgil* hath more fully and amply set forth its praises and commendations in his *Georgicks* where he treats particularly of that Subject, and doth not only recount the pleasures and profits that proceed from it, but very learnedly and ingeniously also treats of the Art it self, and gives many Precepts which are necessary to be observed in the exercise of *Agriculture*, which renders it more delightful and beneficial; *Hesiod* also, one of the prime Poets amongst the Ancients, hath written an excellent exciting and necessary Poem treating of this Art: Several others there are that have copiously and learnedly treated on this Subject, as you may perceive by the *Catalogue* at the end of this Preface.

Also a most evident demonstration and sure Argument of the utility, pleasure, and excellency, of this branch of natural Philosophy, is the Principal care the **Royal and most Illustrious Society** take for the advancement thereof, and for the discovery of its choicest and rarest *Secrets*, and the most facile and advantageous means to improve the several experiments and practises relating to that Subject, as the ever-honored Mr. *Evelin*, a most worthy Member of that Society, in particular hath done on one of the most principal Parts of *Agriculture*, viz. the planting of Trees both for Timber, Fruits, and other necessary uses, and of making that incomparable Liquor, Cider.

But nothing could more conduce to the propagating, encouraging, and improving of this most necessary Art, and of all other Ingenious and Mechanick Arts, Inventions, and Experiments, than the Constitution of Subordinate Societies (after a Provincial manner) in several places of the Kingdom, whose Principal Care and Office might be to collect all such observations, Experiments, and Improvements they finde within their Province relating to this or any other Art within their Inquiry, which particular Societies might annually impart such Collections, Observations, Experiments, and Improvements that they have obtained,

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to the *Grand Society*, and from them also might Copies or Duplicates of the whole Collection be Annually transmitted to each Subordinate Society, That any Person may have a place neerer unto him for the discovery of his Observations, Experiments, Inventions, or Improvements, and that Diligent, Industrious, and Ingenious Persons, may have recourse thereunto, for the Inquiry and Search into the several Inventions, Discoveries, and Improvements of others; by which means every person hath an opportunity to publish or discover his Observations, Experiments, &c. which otherwise are for the most part with their Authors buried in oblivion, and every one hath also the like opportunity or advantage to search into or enquire after the several Ways, Methods, Inventions, &c. used or discovered in any other place of *England*, of such things relating to this Society; which of necessity must abundantly improve Science and Art, and advance *Agriculture* and the *Manufactures*, two of the principal Supports of this Nation, Wealth and Honor.

That the particular Proceedings (already made known) of that most *Illustrious Society*, and the more universal much desired and expected from them, (next unto the publick Peace and Tranquility of the Nation) are esteemed the onely ways and means to promote Industry and Ingenuity, to employ our numerous People, to cultivate our waste Lands, to convert our barren Fields into fruitful Gardens and Orchards, to make the Poor rich, and the Rich honourable, every man is willing to assist in so universal a Work (unless those who thrive by others ruines) we finde many have acted their parts and discovered to the World, what they apprehended or had the experience of, which though much short of what may be done, yet have they not lost their Aym; Many by their Rules, Precepts, Observations, and Experiments have highly advanced this Noble Science of *Agriculture*; But seeing Those treatises, are some of those relating to particular Countreys or Places, or to some branch onely, or part of this our *Subject*, and those also difficult to be obtained, and many of them filled with old obsolete and impatient directions and things, and too voluminous for our Laborious Husbandman, whom they principally concern, I thought it no time ill spent in such times and houres, other necessary Affairs detain me not, to collect such useful Observations, Precepts, Experiments and Discoveries, which we finde dispersed in the several Authors treating of this *Subject*, and to reduce them into the following *Method*, omitting such things as have been found to be useles, false, or meerly putative or conjectural, or relating to other Climates; and adding also such Discoveries, Observations, and Experiments, as I have obtained from others, and my self discovered, and never before published by any. That you have here Epitomised the Substance and Marrow of all or most of the known *Authors*, treating of this *Subject*, or any part thereof, and also
such

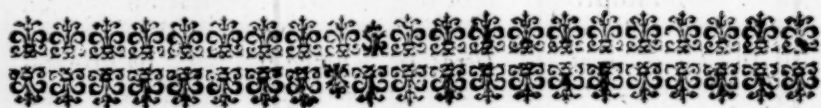
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such new and necessary Observations and Experiments, as are for the benefit and Improvement of our Countrey Habitations, which I hope may gratifie such Readers as desire a work of this Nature; until our *Philosophers* and *Heroes* of Science and Art, handle the *Plough* and *Spade*, and undertake the more plenary discovery and description of these Rustick Operations, which indeed merit and require not onely an experienced hand, but a Judicious and Ingenious Pen, until when I hope this indigested Piece may finde a place in our *Rural Libraries*; and then I shall willingly be the first that shall commit this to the Flames to give way for a better, which that we may suddenly obtain is my earnest desire.

Vale,

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CATALOGUE OF SUCH AUTHORS

Who have written of
AGRICULTURE,
Or of some Branch thereof, and were consulted
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TREATISE.

- A** Rati Phænomena, *A Learned Greek Author.*
Avienus, *De Prognosticis.*
Aulten, *His Treatise of Fruit Trees. A necessary Work.*
Bacon, Lord Verulam, *his Natural History.*
His Treatise of Windes.
Blith *his English Improver Improved. Very useful.*
Butler *his Feminine Monarchy, Or History of Bees: An incomparable Piece.*
Joachim Camerarius, *De Re Rustica: An excellent Piece.*
Cato, *De Re Rustica, A Latine Author.*
Ciceronis *Oeconomica.*
The Countrey-mans Recreation: Or, The Art of Planting, Grafting, and Gardening. In three Books, per Anonimum.
John Evelin Esq; *his Sylva, Pomona, &c. Most ingeniously and incomparably well penned.*
The Expert Gardiner, per Anonimum.
The French Gardiner, written in French, Translated by Mr. Evelin. A good Piece.
The Gardiners Labyrinth.
Glauber, *his Miraculum Mundi, and several other of his small Treatises.*
Hartlib *his Husbandry of Brabant and Flanders; And his Legacy with Annotations on it.*
His Commonwealth of Bees.
Conradus Heresbachius *De Agricultura, written in Latine, translated into*

A Catalogue of Authors.

- into English by Googe, and augmented by Markham.*
Hesiodi Opera & dies cum Commentariis Latinis. A Learned Greek
Author.
Lawson his New Orchard and Garden.
Levet, Of the Ordering of Bees.
Lollius an Italian, his Learned Epistle in Laudem Agriculturæ.
Markham, His Way to get Wealth, Countrey contentments, &c.
Gulielmi Onciaci, Berlium sive Rusticum Oblectamentum.
Palladius De Re Rustica.
Parkinsons Paradisus terrestris.
Gabriel Plat, His Discovery of Infinite Treasure.
Sir Hugh Plat, His Jewel-house of Art and Nature.
His Adams Tool Revived: Or, The New Art of setting Corn.
His Garden of Eden.
Pliny, His Natural History.
Mr. John Rea, His Flora, Ceres, and Pomona: An industrious Work.
Remnant of Bees.
A Treatise of Silk-worms published by Mr. Hartlib.
Southern, Of Bees.
Stephanus, His Maison Rustique, or Countrey-Farm. First written in
French, and translated into English by Surfleete.
Stevenson, His Twelve Moneths.
Tusser, His Five hundred points of good Husbandry: An ancient and
ingenious Piece.
Varro, De Re Rustica. Libri tres.
A Vindication of the Considerations concerning Common Fields and
Enclosures.
Virgilii Georgica.
Sir Richard Weston, His Legacy, &c.
Xenophontis Oecononica, quoted by Lollius.



An Advertisement

TO ALL

Gentlemen, Book-sellers, or others.

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ANALYSIS,
 OR
 Summary of the Ensuing *WORK.*

THE Preface or Introduction, in the
 praise of Husbandry.

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CHAP.



CHAP. I.

Of Husbandry and Improvements in general, plainly discovering the Nature, Reasons, and Causes of their Improvements; and the Growth of Vegetables, &c,



Agriculture hath been (not undeservedly) esteemed a Science, that principally teacheth us the Nature, and divers Properties and Qualities, as well of the several Soils, Earths and Places, as of the several Productions or Creatures, whether Vegetable, Animal, or Mineral, that either naturally proceed from, or are artificially produced, or else maintained of or by the Earth, *Agricultura est Scientia docens, quæ sunt in unoquoq; Agro serunda & faciunda, quæ terra maximos perpetuo proventus ferat*, saith Varro. what Agriculture is.

The Judicious and Understanding Husbandman must first consider the Subject whereon to spend his Time, Cost, and Labor, viz. the Earth, or Ground, which we usually term either Meadow, Arable, Pasture, Woodland, Orchard, or Garden-ground; then whether it be more Commodious or Profitable for Meadow, for Pasture, or for Woods, which in most places are naturally produced, to the great advantage of the Husbandman, or with what particular Species of Grain, Pulse, Trees, Fruits, or other Vegetables, it is best to Plant or Sow the same, to his greatest benefit; And with what Beasts, Fowl, or other Animals to Stock his Farm or other Lands. Also he is principally to consider the best and most commodious way of Tilling, Improving, Propagating, Planting, and Manuring all such Meadows, Arable, and Pasture Lands, Woods, Orchards, and Gardens; and the Reasons and Causes of such Improvements: All which we shall endeavor to discover, to the satisfaction and content of the diligent and laborious Husbandman. Of the Subject whereon the Husband-man bestows his labor.

But before we enter upon the particular Wayes and Methods of Agriculture treated of in this ensuing Work, we shall endeavor to unvail the secret Mysteries (as they are commonly esteemed) of the Productions and Increase of Vegetables, after a plain and familiar Method, not exceeding the Capacity of our Husbandmen, whom this Treatise doth principally concern, by the true

knowledge whereof a gate is opened to Propagate, Maturate, or Advance the Growth or Worth of any Tree, Plant, Grain, Fruit or Herb, to the highest pitch Nature admits of.

Of the Uni-
versal Spirit
or Mercury.

De Fermen-
tatione.

This Globe of Earth that affords unto us the substance, not one-ly of our selves, but of all other *Creatures Sublunary*, is impregna-
ted with a *Spirit* most *subtile* and *Ethereal*, as it were, *divinioris*
Aure particula (as the Learned *Willis* terms it) which the *Original*,
or *Father of Nature* hath placed in this World, as the Instrument
of Life and Motion of every thing. This Spirit is that which in-
cessantly administers unto every Animal its Generation, Life,
Growth, and Motion, to every Vegetable its Original and Vege-
tation; It is the *Vehicle* that carryeth with it the *Sulphureous*, and
Saline parts, whereof the Matter, Substance, or Body of all Vege-
tables and Animals are formed or composed. It is the Operator or
Workman, that transmutes by its active heat the *Sulphureous* and
Saline parts of the Earth or Water into those varieties of Objects
we daily behold or enjoy, according to the different Seed or Ma-
trix wherein it operates; It continually perspires through the
pores of the Earth, carrying with it the *Sulphureous* and *Saline*
parts, the onely treasure the Husband-man seeks for, as hath been
by some Ingenious Artists mechanically proved, by receiving the
same between the *Vernal* and *Autumnal Equinoxes* in an Alembick-
head, where it hath condensed, and copiously distilled into the
Receiver, at that season of the year, the Earth than more liberal-
ly affording it, than in the Winter season; which Spiritual Liquor
so received, is not a Treasure to be slighted or neglected, carry-
ing with it the onely Matter of Vegetables, as the same *Artists* af-
firmed, that having placed the same under a *Melon-Glass* near
some *Vegetable*, it was thereby wholly attracted externally, and con-
verted into that *Vegetable*; they concluded also the same to be that
Materia Prima quæ absq; omni sumptu, labore & molestia reperta est, &
quam in aere capere te oportet antequam ad terram perveniat, &c. This
Liquor undoubtedly would be of singular Vertue and Effect in ad-
vancing and maturing the Growth of the more excellent Flow-
ers or Curiosities, being irrigated therewith. It is easily obtained,
and that in great Quantities, by such that think not a little time and
lab or lost, to scrutine into the Mysteries of Nature. But whether
we obtain it singly, or simply, or nor, this we know, that it is to be
received by placing the more natural *Receptacles*, the Seeds and
Plants in the Earth, which gives it us transmuted into such Forms
and Substances as are most desired and necessary.

Of the univer-
sal Sulphur.

De Fermen-
tatione.

Although the Spirit or Mercury be that active and moving
part, and that principally appears in the Generation or Con-
ception of any Vegetable or Animal, and is also the first that flies
in the separation or dissolution of Bodies; yet is it imbecile and
defective without that most Excellent, Rich, and *Sulphureous Prin-*
ciple, which (according to the description of the Learned *Willis*) is
of a little thicker consistence than the *Spirit*, and next unto it the
most active; for when any mixture or compound is separated, the
Spirits first fly, then follow after the *Sulphureous Particles*, the Tem-
perature

perature of every thing to far as to the Heat, Consistence, and curious Texture thereof doth principally depend on *Sulphur*, from hence every Plant, Fruit, and Flower, receives those infinite varieties of Forms, Colours, Gusts, Odours, Signatures, and Vertues; it is that which is the proper *Medium* to unite the more Volatile *Mercury* or *Spirit* to the more fixed *Salt*, *Spiritus*, *Mediante Anima*, *cum corpore conjungitur & ligatur, & fit unum cum eis*, say the *Philosophers*. This *Sulphur*, or oily part is easily separated and distinguish'd in *Vegetables* by the more curious, it ariseth out of the earth with the aforesaid *Mercury* or *Aqueous Spirit*, though not at the first discernable, yet in every Plant more and more maturated and augmented by the Suns influence, as the *Seed* or *Matrix* is more or less inclined to this Principle; This is also that which gives to our hot and stinking Dungs, Soils, or Manures, the Oleaginous pinguity and Fertility, and which begets that fiery heat which is in *Vegetables*, as Hay, Corn, &c. laid on heaps not throughly dry.

Not onely the Duration of *Individuals*, but also the Propagation of the Species dependeth much on the Principle of *Salt* for the Growth of Minerals, the Fertility of Land, the Vegetation or Growth of Plants, and chiefly the fruitful Fetation and Progeny of Animals have their Original from their *Saline Seed*. This *Salt* obscurely passeth with the *Mercurial Spirit* and the *Sulphur*, and is associated therewith, where ever that passes, and where it finds a convenient *Receptacle*, *Seed*, or *Matrix*, it is more fixed than either the *Sulphur* or *Spirit*. This *Salt* is that which gives to every Creature a Substance or Body, without which neither the *Spirit*, nor *Sulphur* could be reduced or coagulated into any Form; It is in every thing, *Sal autem reperitur in rebus omnibus*. It is Volatile, when carryed in the wings of the *Spirit* and *Sulphur*, by the natural Fire or Motion: But afterwards it is more fixed, when separated from the *Spirit*, or *Mercury*, and *Sulphur*, by artificial Fire, as appears in the ashes, or *Caput Mortuum* of all *Vegetables*, *Animals*, or *Minerals* distilled or burnt; much also of the *Sulphureous* or *Mercurial* parts are coagulated by, or transmuted into the *Saline* by natural or artificial Heat or Warmth, as is evident in the *Sea*, the nearer it is to the *Equinoctial Line*, and the more it receives of the Perpendicular or direct Beams of the Sun, the greater quantity of *Salt* it contains, not onely by the exhalation of the *Aqueous* or *Phlegmatick* parts, but the Maturation, Transmutation, or Fixation of the more Volatile, *Spiritual*, and *Sulphureous* parts, into the more *Saline* or fixed; for in those hotter *Climates* the Land it self also is more Fertile through the abounding quantity of this Vegetating *Salt*, as appears by the great plenty of *Nitre* or *Salt terra* found in the hotter *Climates*, lying on the Surface of the Earth in the morning like a hoary Frost; when the Regions nearer the *Poles*, having not those natural advantages of the *Sun-beams* in so high a degree are not so Fertile, nor abound so much with *Salt*, the most principal cause of Fertility.

Of the Universal Salt.
Willis de fermentatione.

Of the true
Matter of Ve-
getables.

Where Water
or Spirit a-
bounds.

But we will leave these *Philosophical Principles* as they are simply and a part very necessary to be known by those that Operate in the more *Secret, Mystical, and Mechanick* Indagations of Nature, and discourse onely of that *Universal Spirit or Vapor*, which daily, and every moment perspires and proceeds out of every part of the Earth, and is in every thing containing in it self the *Spirit, or Mercury, the Sulphur, and the Salt* in one body united: and without Art indivisible, yet some one part or principle abounding more or less in every thing, as the Water containeth more of the *Spiritual or Aqueous* part; several *Fruits, Plants, Flowers, and Soils*, more of the *Sulphureous*; and *Barks of Trees, blood of Animals, and several Minerals*, more of the *Saline*. And wheresoever these *Principles* are most equally tempered or mixed, there is most of Fertility, as is evident in the several *Natures, Tempers, and Qualities* of Places; for the Production or Propagation of *Vegetables*, and wheresoever any or either of these *Principles* do overmuch abound, *Vegetables* are not produced; as *Waters*, or any other *Liquors, or Spirits*, are not Fertile in themselves as to *Vegetation*, unless they are either conjoynd with some other Substance or Matter, or the more *Phlegmatick* parts evaporated, and the remaining part matured by the Sun or Air into an augmentation of the other *Principles*, then is it capable of yielding naturally some sort of *Vegetables*; For although several *Plants* set in *Water* onely, do emit fibrous roots, and flourish therein for a time; yet is it meerly an attraction of the most *Saline* and *Sulphureous* parts or *Principles* to its own relief, as is evident by its better thriving, if the *Water* be often changed: At best this nourishment is but weak, having so little of the *Sulphur* and *Salt*, as the *Withy, Poplar*, and other *Aquatick* *Plants* demonstrate. Therefore out of any sort of *Waters* onely, it is in vain to attempt any material or effectual encrease of *Vegetables*, other than that are naturally *Aquatick*, because they contain a superabundant *Spirit* or *Moisture*: But our *Spiritus Mundi*, or *Materia propinqua Vegetabilium*, although it appear in a Liquid form, yet it contains actually an equal proportion of the three *Principles*: And the more any Substance or Matter is impregnated or irrigated therewith, the more prone or apt it is to *Vegetation*; As *Rain-Water* being aminated with it by the continual *Exhalations* or *Fumes* ascending from the Earth, and by it coagulated and detained, is more prone to *Vegetation* than any other *Waters*, as you may perceive by *Plants* watered therewith, and by its sudden Generation of *Animals* and *Vegetables* in the Spring time, then the Earth more copiously breathing forth that *Spiritus Mundi*, which returned again, doth by the vivifying heat of the Sun easily transcend into another Species. How soon will *Horse-hairs* receive life, lying in *Rain-Water* but a few dayes in the heat of the Sun in the Spring time, whereof I have seen many in the *Highways*, after *Rain* in the Moneth of *May*, very nimble and quick, that had not yet lost their shape of a *Horse-hair*; This is worthy our further enquiry, to what Period this may be advanced, it may also serve as an *Index* to point at several other Excellent Discoveries.

Neither

Neither is the more *Sulphureous* part or *Principle* of it self capable of yielding *Vegetables*, being of too hot and pinguid a Nature, as the Dung of Animals (and especially of Volatiles that eject no Urine, whereby the more fiery and *Sulphureous* part of the others is diluted) containing much of that pinguidity, produce no *Vegetables* of it self, unless commixed or allayed with some other Matter abounding with the other *Principles*, or that it loose its too fiery or destructive Nature, by being exposed to the Sun or Air, untill it be evaporated, then will it emit several *Vegetables*; Of the like Nature also are the flesh and bones of Animals, yielding a very rich Compost, though of themselves (through over-much heat and pinguidity) sterile.

The *Saline*, or more fixed *Principle*, which is esteemed by most Authors the onely thing conducing to Fertility; yet is of its self, or in an over-abounding quantity, the most barren and unfruitful. It is prescribed as a sure way to destroy Weeds (*Vegetables*) by watering the place with Brine or Salt Water, yet what more fruitful, being moderately commixed with other Materials of another nature, than Salt? But observe, that Salts extracted out of the Earth, or from *Vegetables*, or Animals, are much more Fertile, than those of the Sea, containing in them more of the Vegetative Power or *Principles*, and are therefore much to be preferred. *Glauber* makes it the highest Improvement for the Land, and for Trees also, affirming that by it you may enrich the most barren Sands, beyond what can be performed by any other Soils or Manures, in case it be deprived of its Corrosive Qualities; for then will it naturally attract the other *Principles* continually breathing out of the Earth, and in the Air, and immediately qualifie it self for Vegetation; as I observed in a parcel of Field Land of about three Acres *densified* or *burn-baited* in a very hot and dry Spring of it self naturally barren, and after the burning and spreading the ashes, wherein was the Fertile Salt deprived of its Corrosive sterile quality, the Land was ploughed very shallow, and Barly sown therein about the beginning of May, in the very ashes as it were (no Rain falling from the very beginning of cutting the Turf) yet in thirty and six hours was the Barley shot forth, and the Ground coloured green therewith, this Salt attracting and condensing the ever breathing *Spirit*. The like you may observe in Walls and Buildings, where several sorts of *Vegetables*, yea, Trees of a great bigness will thrive and prosper remote from the Earth, and without any other nourishment than what that Fertile Salt attracts and condenses, as before; which it could not have done, had it not been purged of its Corrosive and Sterile Nature by Fire when it was made into Lime; For all *Chymists* know that no Salts more easily dissolve *per deliquium*, than those that are most calcined.

The Salt also of the Sea is not without its Fertile Nature, being ordered with Judgment and Discretion, as we see evidently, that the Salt Marshes (out of which the Sea is detained) excel in Fertility: and many places being irrigated with the Sea Water, yield a notable increase; Corn also therewith imbibed, hath been much advanced

where Flames
or Sulphur abounds.

Where Salts abound.

Continuation
Miraculi
Mundi.

advanced, as appeared in the President of the Countrey-man that casually let his Seed-Corn fall into the Salt-Water; The shells of fish being as it were only Salt coagulated, have proved an excellent Manure for barren Lands after they have lain a competent time to dissolve.

Equal com-
mixture of
Principles.

From what hath been before observed, we may conclude that the highest Fertility and Improvements are to be advanced and made from the most equal Commixture of the aforesaid several *Principles*, or of such Waters, Soils, Dungs, Salts, Manures, or Composts that more or less abound with either of them, having regard unto the Nature of such *Vegetable*, whose propagation or advancement you intend; Some delighting in a more Hot, Cold, Moist, or Dry, Fat, or barren, than others; And next unto that from due Preservation, Reception, and right disposing and ordering of that *Spiritus Mundi*, every where found, and to be attained without Cost, and as well by the poor as rich.

It continually breaths from the Earth, as we noted before, and is diffused in the Air, and lost unless we place convenient Receptacles to receive it, as by Planting of Trees, and sowing of Pulses, Grain, or Seeds. Out of what think you should these things be formed or made? Out of Rain-Water, is the common Answer or Opinion: But we experimentally finde that this *Universal Subject* gives to every Plant its Essence or Substance, although assisted by Rain or Water both in its nourishment and condensation.

We see how great a Tree is raised out of a small Plat of Ground, by its sending forth of its Roots to receive its nourishment, penetrating into the smallest Crannies and Joynts between the Stones and Rocks, where it finds the greatest plenty of its proper food. We constantly perceive and finde that Vegetables having once emitted their fibrous Roots, vegetate and increase onely from the assistance of this our *Universal Subject*, when the Earth wherein it stands is of it self dry, and not capable to yield that constant supply of Moisture the Plant daily requires. Although we must confess that Rain or other Water accelerates its Growth, having in it a Portion of that *Spiritus Mundi*, and also the better qualifies the Earth for its perspiration.

That this *Subject* is the very Essence of Vegetables, and that from it they receive their Substance, & not from water only is evident, in such places where Vegetables are not permitted to grow: And where it cannot vapor away, nor is exhaled by the Sun, nor Air, as Under-buildings, Barns, Stables, Pigeon-houses, &c. where it condenses into Nitre, or Salt-Petre, the onely fruitful Salt (though improperly so called) containing so equal and proportionable a quantity of the *Principles* of Nature, wholly Volatile, onely condensed in defect of a due recipient, not generated as some fondly conceive from any casual Moisture, as Urine in Stables, &c. though augmented thereby, but meerly from the *Spiritus Mundi*, Lands resting from the Plough or Spade, are much enriched onely by the encrease of this *Subject*, and ordinary way of Improvement.

Lands

Lands defended from the violent heat of the Sun, and from the sweeping, cleansing, and exciccating Air or Winds grow more Fertile, not so much from the warmth it receives, as from the preservation of that Fertile *Subject* from being wasted, as we evidently see it to be in all open Champion Lands, when part of the very same Species of Land being inclosed with tall and defensive Hedges, or Planted with Woods, are much more Fertile than the other; yea, we plainly perceive that under the Covert of a Bush, Bough, or such like, any Vegetable will thrive and prosper better than on the naked Plain; where is there more barren, dry, and hungry Land than on the Plains and Waste Lands? and yet but on the other side of the hedges Fertile, either by Inclosure or Planted with Woods; an evident and sufficient demonstration of the high Improvements that may be made by enclosure onely. Also Land hath been found to be extraordinary Fertile under Stones, Logs of Wood, &c. onely by the condensation and preservation of that *Universal Subject*, as appears by the flourishing Corn in the most stony Grounds, where it hath been observed that the Stones taken away, Corn hath not proved so well; and Trees having Stones laid on the Ground about the Roots of them, have prospered wonderfully from the same cause: As the Learned *Virgil* hinted on the same occasion.

--- Jamq; reperti

Qui Saxo super, atq; ingentis pondere teste

Urgerent; ---

In the watering of Meadows, you may observe that the superficial glyding watering thereof doth infinitely advance its fertility, and accelerates its growth or vegetation, not so much from the fruitfulness of the water, (although that be a very great help, and some waters abound very much with that *universal subject*) but by its condensation and preservation of that *subject*, as appears by the warmth and early springing of such Meadows, where the water thinly and superficially moves over it; where on the contrary, water standing and submerging such Meadows, and lying and soaking long under the superficies of the Earth, impedes the motion of that *subject*, and makes the ground more sterile, and backward in its growth or springing. That this *Spiritus Mundi* hath in it a sensible heat as well as fertility, we may perceive by Springs in great Frosts, when the Pores of the Earth are shut; the Body from whence the Springs flow is warm; on the contrary, when the Pores are open, and this *Spirit* wasted, and transformed into Vegetables, Animals, &c. and exhausted by the heat of the Sun, then is the Body internally cold, as we sensibly perceive by the waters in Wells in Summer time.

This *Spiritus Mundi* whereof we treat, is that which in some places perspires more freely than in other, and causes that different verdant colour of the Grass in certain rings or circles, where the Countrey people fancy the *Fairies* dance.

The more the Aqueous humour or part is concocted or exhausted By the heat of the Sun, in the Summer time, the thicker and more

more viscous is this *subject*, as appears by its condensation in the *Air* into *Mildews*, which after a more glutinous manner than other Rains or Dews, is by the cool Air condensed into a fat and fruitful matter, part thereof resting on the close and glasse leaves of the Oak, and such like Trees, and is collected and with very little art transformed by the industrious Bee, into that noble substance *Honey*, other part thereof falls on the young *Ears* of *Wheat*, and the Buds of springing *Hops*, where suffering a further degree of congelation, impedes their growth, unless a timely shower wash it off: It also by its heat tinges the straw of corn, and the leaves of some Trees in spots. At that season of the year also it usually coagulates in some places into *Mushrooms*, which are meerly formed and made up of this subject undigested, and perspiring forth in such places in great plenty, that I have seen a *Mushroom* near an Ell in compass of less than two days growth; the Owner in whose Garden it grew, affirmed it to be of one night onely. You may also perceive it in a clear and cool morning condensed into small lines like unto Spiders webs, near the surface of the earth, especially on the lower and richer Lands.

This is that *Viscous* Vapour that being concocted and digested long in the Air by the heat of the *Sun*, or otherwise, is condensed at length into that *Sulpherous* and *Saline* Matter, by its combat in the Air occasions those *Igneal* Flames, and Claps of Thunder, which more frequently happen at such seasons of the year, and in such Climates when and where this more concocted *Vapour* abounds; and less in the colder Climates and Seasons, where it is more aqueous.

This is that inexhaustible treasure the Country-man is to seek to preserve, much more than the Soils, and Dungs, and such like matters washed away with waters into the Sea, which are inconsiderable in comparison of this; for although Land be never so much impoverished through over-tilling thereof, yet duly order'd and defended, by this onely Subject may it be recruited and Fertilized, as is evident in the poorest Land where Trees are grown, after the removal of them, the Land is much enriched by their shelter. Also the return of the Soil or Dung that is made of the Product of any Land either by Pasturing or Tilling the same, is a principal part of a good Husband, and not to feed Cattel, cut Hay, and sow Corn on some Lands, and spend their Soil and Manure on other, which is a grand neglect, and a main cause of so much barren and unfruitful Land in *England*.

Another thing worthy our Consideration concerning this *Universal Subject*, is the abating or removing the Impediments of its Fertility, which do as it were suffocate or conceal that fertile or vegetating quality that is in many things; As in Chalk, and several other Stones, Minerals, and Earths, the Acid or sterile Juice doth prevent that Fertility, which otherwise might be raised from it. Therefore do our Husband-men usually burn Stones into Lime, which gradually evaporateth the Acid quality, and coagulateth and fixeth the more Saline and Fertile, which causeth it to yield
so

so plentiful a nourishment unto Vegetables more than before it was burnt into Lime.

For the same cause is the Superficies or Turf of the Earth burnt in many places, which Country-men usually call *denfiring* or *burn-baiting*, onely they suppose that the Ashes of the Vegetable contained in the Turf, occasions the Fertility: But although that doth yield a part, yet it is the heat of the Fire evaporating and consuming the Acidity of the Earth, which makes the Earth it self so prepared, to be the more fertile; As you may observe by the very places where those hills of fire were made, that although you take the Ashes wholly away, yet the Earth under those hills being so calcined, yield a greater nourishment to such Vegetables growing thereon, than any other part of the ground where the Ashes themselves are spread.

For the same reason are the Summer Fallowings advantageous to the Husbandman, not onely for the destroying of the weeds, but for the evaporation of the Acid barren Juice, and digesting and fixing the fertile; By which way of Calcination may several *Stones*, *Minerals*, and *Earths* be made fertile, which unprepared are not so; this may also prove of great use for the advancement of the growth of many excellent Plants and Flowers, as I have been credibly informed it hath been secretly practised to that purpose.

The last and none of the least considerable means for the re-reviving and improving this *Subject*, is not onely the planting, sowing, and propagating of *Vegetables* in every place, but to plant, sow, or propagate such that delight in the *Soyl* or *Place* under your improvement, be the nature of the *Soyl* or *Earth* what it will, there is some Plant or other delights in it, from the highest, cold, hot, dry, or barren hill, to the lowest valley, although in the water it self, you will finde either *Trees*, *Pulses*, *Grasses*, *Grains*, or some other *Vegetable* may be found that will thrive in it. *Hic segetes, illic veniunt felicius uvae; Arboris fetus alibi; atque myrissa virescunt gramina, &c. Virgil.* The want of the right understanding hereof, hath been one of the greatest Checks to our English Improvements, there being so great variety of Land in this Kingdom, yea almost in every Parish doth the Land vary, that when we have had any new way or Method of Improvement urged, by sowing or propagating any new sort of Grain, Pulse, or Hay, or otherwise, several have attempted it, few onely perhaps have hit the mark, or applyed it to the right *Soyl*, the rest having lost their labour and cost meerly through their own ignorance of the true nature and way of ordering of what they undertake, have cast a scandal on the thing it self, to the great discouragement of others, who otherwise might have reaped great advantage by it.

Having thus given you a short Description of the Growth of *Vegetables*, and of that *Universal Subject*, or *Spiritus Mundi*, out of which they are formed, and of the general Causes of *Improvements*, I will now descend to the more particular and practicable Application thereof; And first



CHAP. II.

Of the great Benefits and Advantages of Enclosing Lands,

ENCLOSING of Lands, and dividing the same into several Fields, Pastures, &c. is, and hath been ever esteemed a most principal way of Improvement, it ascertaineth every man his just and due Propriety and Interest, and preventeth such infinite of Trespasses and Injuries, that Lands in common are subject unto, occasioning so much of Law, Strife, and Contention; It capacitates all sorts of Land whatsoever for some of the Improvements mentioned in the subsequent Discourse, so that a good husband may plant *Timber, Fruit*, or other *Trees* in his Hedge-rows, or any other part of his Lands, or may convert the same to *Meadows, Pasture, Arable*, or *Gardens*, &c. And sow or plant the same with any sorts or species, of Grain, Pulse, or other Tillage whatsoever, without the check or controul of his unthrifty or envious neighbors.

Enclosure an
Improvement.

It is also of its self a very considerable Improvement; And take it, as it is the most general, so it is one of the highest Improvements in *England*, and it seems to have born an equal honor and preheminance, above Lands in Common in other Countreys; and to contend for its Antiquity with the Plough it self, else why should *Virgil* say?

*Ante Jovem nulli subigebant arra Coloni,
Nec signare quidem, aut partire limite Campum,
Fas erat, ---*

Enclosure with a good tall Hedge-row, preserves the Land warm, and defends and shelters it from the violent and nipping Winds, that generally nip and destroy much of the Corn, Pulse, or whatsoever grows on the open Field or Champion Grounds, and preserves it also from those drying and scorching Winds more frequent in hot and dry Springs, much damaging the Champion Lands; It much preserves that fertility and richness the Land is either naturally subject unto, or that is by the diligent care and cost of the *Husbandman* added. It furnisheth the Owners thereof with a greater burthen of Corn, Pulse, or what ever is sown thereon; Also where it is laid down for Meadow, or Pasture, it yields much more of Grass than the open Field Land, and the Hedges being well planted with *Trees*, affords shelter and shadow for the Cattel both in Summer and Winter, which else would destroy more with their feet, than they eat with their mouthes, and might loose more of their fat or flesh in one hot day, than they gain in three cool days; and affords the industrious *Husbandman* plenty

ty of Provision for the maintenance of Fire-boot, Plough-boot, Cart-boot; and (if carefully planted and preserved) furnishes him with Timber, Malt for his Swine, and Fruits for Cider, as we have in several other parts of this Treatise casually hinted.

It is one of the greatest Encouragements to good Husbandry, and a good Remedy against Beggery; for it brings Employment to the poor, by the continuall labor that is bestowed thereon, which is doubly repaid by the fruitful Crop it annually yieldeth, and generally maintains treble the number of Inhabitants or more than the Champion, as you may easily perceive if you compare such Counties and Places in *England*, that are for the most part upon Enclosure, with the Champion, and Chilterne Counties or Places; And compare also the difference of their manner and condition of Living, and their Food and Apparel, &c. it must needs convince you that Enclosure is much to be preferred above the Champion, as well for the publique as private advantage. Our Predecessors were very sensible of the difference, as appear by what ingenious old *Tusser* (who took upon him Husbandry in *Edward the Sixth* days) saith in his *Rhythms* in his Comparison between *Champion, Countrey, and Severall*.

25. One barefoot and ragged doth go,
And ready in Winter to sterbe;
When t'other ye see do not so,
But hath that is needful to sterbe.
One pain in a Cottage doth take,
When t'other trim Bowers do make.

26. One lapeth for Turf and for Hedge,
And hath it with wonderful suit,
When t'other in every Hedge,
Hath plenty of Fuel and Fruit;
Evils twenty times worse than these,
Enclosure quickly would ease.

27. In Wood-land the poor men that have
Scarce fully two Acres of Land,
More merrily live, and do save,
Than t'other with twenty in hand;
Yet pay they as much for the two,
As t'other for twenty must do.

The Differences also, and the Profits thereof, are plainly to be discerned and proved by the Severals, or enclosed Parcels of Land that have been formerly taken out of the Field-land or Commons, and how much they excel the other, in every respect, though of the same soyl, and onely a Hedge between; and what a yearly value they bear above the other.

And also by the great quantities of Lands that have within our memories layen open, and in common, and of little value, yet when enclosed, tilled, and well ordered, have proved excellent good Land, and suddenly repayed the present and greatest expence incident to Enclosure.

Of all which, and many other infinite Pleasures, Contentments, and Advantages that Enclosure yields above the Champion and Field-Land, were they but sensible who so much affect and contend for the Champion, &c. they could never be so brutish as to persist in so injurious and unthrifty a method of Husbandry, both to themselves, to their neighbors, to the poor, and to the Commonwealth in general.

Several Interests an Impediment.

This great Improvement meeteth with the greatest difficulties and impediments; amongst which none appears with a bigger face, than the several Interests and diversity of Titles and Claims to almost every Common-field or waste Land in *England*; And although (by many) the greater part of the Interested Persons are willing to divide and enclose it, yet if but one or more envious or ignorant persons concerned oppose the Design; or that some or other of them be not by the Law under a capacity of assuring his Interest to his Neighbor, the whole must unavoidably cease, which hath proved a general Obstruction, and hath been frequently complained of; For the remedy whereof, a Statute to compel the Minor party to submit to the Judgement and Vote of the Major, and equally to capacitate all persons concerned for such an *Enterprise*, would be very welcome to the Country-man, wherein all particular Interests might be sufficiently provided for, as well the Lord of the Soyl, as the Tenant, and the poor.

High-ways an Impediment.

It is a common thing to have very many great and large High-ways over most of the *Common Fields* and *Waste Grounds* in *England*, which prove a very great *check* to the Design of *Enclosure*, and may most easily be reduced, if a Statute may be obtained for that purpose, which was not long since in agitation, though not completed; Than which, as well for the Compulsion and Enabling of opposite and uncapacitated persons, and providing for several Interests, as for the Regulating and right Disposition of Common and necessary Ways, no *Act* or *Statute* can be of greater or more *publique* Advantage to the Kingdom, in the more vulgar way or method of *Husbandry*.

Trees not thriving. an Impediment.

There are several Common-fields, Downs, Heaths, and Waste Lands, that should they be enclosed, it would be very difficult, and in some places seem impossible to advance or propagate any quick Fences, or considerable quantity of Trees, as before is hinted at, by reason of the great Drought such Land is subject unto in the Summer, and destructive cold Winds in the Winter and Spring. To which we reply, That after, or according to the usual manner of Planting such Trees or Hedge-rows come to little, because the young Cions they remove, are commonly brought from a fertile, warm, or moist Soyl, into a cold, barren, or dry, which must needs produce such an inconvenience.

Also they oftentimes plant Trees not naturally agreeing with the Soyl they remove them into, or else plant them deep into the barrenest part of the Earth; or at least take little or no care to defend them (when planted) from the external Injuries of Drought, Cold, &c.

But

But if any are willing, or intend to raise a Quick-fence, or propagate Trees on such open Land subject to such Inconveniences, the onely way is to raise a sufficient quantity before-hand in a Nursery for that purpose, of such Trees or Plants that naturally delight in that Land where you intend to plant them, and then to place them in such order, (as you will finde hereafter described in the Chapter of *Woods*,) that the Roots be not below the best Soyl; and that they have a sufficient Bank to shelter them on the one side, and an artificial dry Hedge on the other, which may be continued till the quick Plants are advanced above common Injuries; Or you may sow the Seeds of such Trees you intend to propagate in Furrows, made and filled with a good Earth, and secured from Cattel, either by a double Hedge, or by ploughing the Land for several years; and not feeding the same with Cattel, till such time as the Trees are grown up, which will soon repay the imaginary loss of the Herbage, or Grasing, especially if the young Cions be (the first and second years of their growth,) a little sheltered from the sharp Winds by shattering a little Straw, Brake, or Hawk lightly over them, which will also rot and prove a good Manure, and qualifie the heat and drought of the Summer.

And when once you have advanced an indifferent Bank, Hedge, &c. about your New Enclosures, you may much more easily plant and multiply Rows and Walks of Timber, Fruit, and other necessary Trees, the destructive edge of the cold Winds being abated by the Hedges, &c. We frequently have observed on several high and supposed barren Hills and Plains, Woods and Trees flourish, and in open Fields or Gardens within the shelter of those Woods, Trees and other Plants prove as well as in the lower Valleys; that it is enough to convince any rational person, that by Enclosure onely, may most, if not all the Open, Champion Plain, Waste, and supposed barren Lands in *England*, be highly improved and advanced to an equal degree of Fertility, to the Enclosures next adjacent, using the same good Husbandry to the one as to the other, which can never be whilst it is in Common.

It is observed that of most sorts of Land, by how much the smaller the Enclosure or Crofts are, the greater yearly value they bear, and the better burthen of Corn or Grass, and more flourishing Trees they yield; and the larger the Fields or Enclosures are, the more they resemble the Common Fields or Plains, and are most subject to the like inconveniencies. We generally finde that a Farm divided into many Severals, or Enclosures, yields a greater Rent, than if the same were in but few.

Too many Hedges and Banks in rich or watered Meadows waste much Land, and injure the Grass by its shadow, and by dripping, for that needs no shelter, Grass abides any weather; and in case the cold Spring keeps it back, it fears not Drought, but hath water and heart sufficient to bring it forwards, unless you plant such proving *Aquatick* Trees, whose throwds shall exceed in value the Grass they injure, which may well be done in Rows, and on the edges

Dividing Land into small parcels an Improvement.

Enclosing of watered Meadows not an Improvement.

Wheat in En-
closures sub-
ject to Mildew

Legacy.

edges of the Banks, &c. and will amount unto a considerable Improvement, if you select the right kinds.

That Wheat sown in Enclosures, or any Land under the Winds, is subject to *Mildew*, is a general opinion amongst Husbandmen: And the onely great Inconveniency Enclosure is subject unto, Mr. Hartlib saith, is *Mildew*, but this is onely an injury to one sort of Grain; Neither is it yet certain that Enclosure is the cause, for we finde and observe that Wheat in the Fielden Countrey is subject to *Mildews*, though not so frequent as in the Enclosure, by reason that the Land is not so rich generally, nor so moist as Enclosures are, which in Summer time emit a greater quantity of that Moist Spirit, or *universal Matter of Vegetables* (whereof we discoursed before) than the dry, hungry, open Field-Land doth; which being coagulated in the Air falls in form of a Dew, sometimes on the Oak, and is then food for Bees, sometimes on Hops and on Wheat, whether high or low, enclosed or open; Nay, sometimes on the one half of a Hop-garden, or a Wheat-field, and not on the other.

But *Blasting* hath commonly been mistaken for *Mildew*, Wheat being subject also to it in the best and richest Lands in moist years, (whereof more in another place,) that we cannot finde Enclosure onely to be the cause of either *Blasting* or *Mildew*, other than that it is the richest and best Land. Also we may observe, that in the Wood-lands or Countreys where most Enclosure is, there the Land yields the greatest burthen of Wheat, as well as other Grain, and more rarely fails than in the Champion Countrey, wet Summers being not so frequent as dry; The *Vales* and *Enclosures* also being by far the greater Support of our English Granary, than the Open, Champion, and the Hills; which yields us, 'tis true, the greater part of our Drink Corn delighting in the more hungry Soyl, and proves a good Supply in a wet Summer for the other.



CHAP. III.

Of Meadow and Pasture Lands, and the several ways of their Improvements, either by watring or drowning; or by sowing or propagating several sorts of extraordinary Grasses or Hays, &c.

M*eadow and Pasture Lands* are of so considerable use and advantage to the Husband-man, that they are by some preferred above Arable, in respect of the advantage they bring annually into his Coffers, with so little Toil, Expence, and Hazard, far exceeding in value the Corn Lands; and of principal use for the Encrease and Maintenance of his Cattel, his better food; And the chiefest strength he hath for the Tilling and Improving his other Lands, *Meadow*, and *Pasture Lands* are generally of two sorts, *Wet* or *Dry*, the *Wet Meadows* are such, that the Water overflows or drowns at some times of the year, under which term we shall comprehend all such Meadows, or other Lands that are artificially watred or over-flown, or that are under that capacity of Improvement. The dry *Meadows* or *Pastures* are such that are not over-flown or watred by any River or Stream, under which we shall comprehend all such *Inclosures* or *Severals* that lie warm and in a Fertile Soil, yielding an annual burthen of Hay or Grass, or that are capable of Improvement, by sowing or propagating of new Grasses, Hays, &c. or other wayes of Improvement.

Sect. I.

Of the Watring of Meadows.

Of *Wet Meadows* or Land under that capacity of being over-flown or watred, there are several sorts.

First, Such Meadows that lie generally flat on the Banks of great Rivers, and are subject to the over-flowing of such Rivers in times of Land-floods onely.

Secondly, Such Meadows that lie near to lesser Rivers or Streams, and capable of being drowned or watred by diverting such River, or some part thereof out of its natural Current over the same.

Thirdly, Such Meadows or Lands that lie above the level of the Water, and yet are capable of Improvement by raising the Water by some artificial ways or means over them.

All which sort of Meadows or Lands under those capacities are
very

very much Improved by the Water over-flowing them, as every County and place can sufficiently evidence and testify,

Virgil.

----*Humida Majores herbas alit.*----

Neither is there scarcely any Kingdom or Country in the World, where this is not esteemed an excellent Improvement. How could *Egypt* subsist, unless *Nilus* did annually Fertilize its Banks by its Inundation? Several other Potent and Wealthy Countreys there are in those *African* and *Asian* Territories, whose richest and most Fertile Lands are maintained in their Fertility by the Sediment of the over-flowing Waters.

Virgil.

---*Huc summis liquuntur rupibus Amnes
Felicemq; trahunt limum;*---

But these are Natural, yet are not some Countreys without their Artificial ways of advancing this ponderous Element to a very considerable Improvement, as *Persia*, *Italy*, &c. abound with most ingenious ways for the raising of the water, as well for their Meadows as other necessary uses.

Of Meadows
watered by
Floods.

On the Banks and Borders of our great Rivers and Currents, are the most and richest Meadows, consisting generally of a very good fat Soyl, as it were composed of the very Sediment of the Water overflowing the same, after great and hasty Rains, such Meadows are capable of very little Improvement, especially those that border on the greater Rivers, as *Thames*, *Severn*, *Trent*, *Ouse*, &c. incapable of obstruction at the pleasure of the Husbandman.

Yet where such Meadows lying on the borders of great Rivers, are of a dry and hungry Soyl, and not frequently overflowed by Land-floods, may Artificial Works be made use of for the raising the water over the same to a very considerable advantage: whereof more hereafter in this Chapter.

Of Meadows
watered by di-
version of Ri-
vers, &c.

Other Meadows there are, and those the most general in *England*, that border on the lesser Rivers, Streams, &c. and in many places are overflowed or drowned by directing the Water out of its natural and usual Current over them: This is of late become one of the most universal and advantageous Improvements in *England* within these few years, and yet not comparable to what it might be advanced unto, in case these several Obstructions were removed that impede this most noble and profitable Improvement.

Hinderances
to drowning.

First, The several Interests that are in Lands bordering on Rivers, hinder very much this Improvement, because the Water cannot be brought over several quantities of Land under this capacity, but through the Lands of ignorant and cross Neighbours, who will not consent thereunto (although for their own advantage also) under unreasonable terms, and some will not at all, others are not by the Law capacitated for such consent, (as we noted before concerning Enclosures.)

Secondly, That great and pernicious impediment to this Improvement, Mills standing on so many fruitful Streams prohibiting the Laborious and Ingenious Husbandman to receive the benefit and advantage

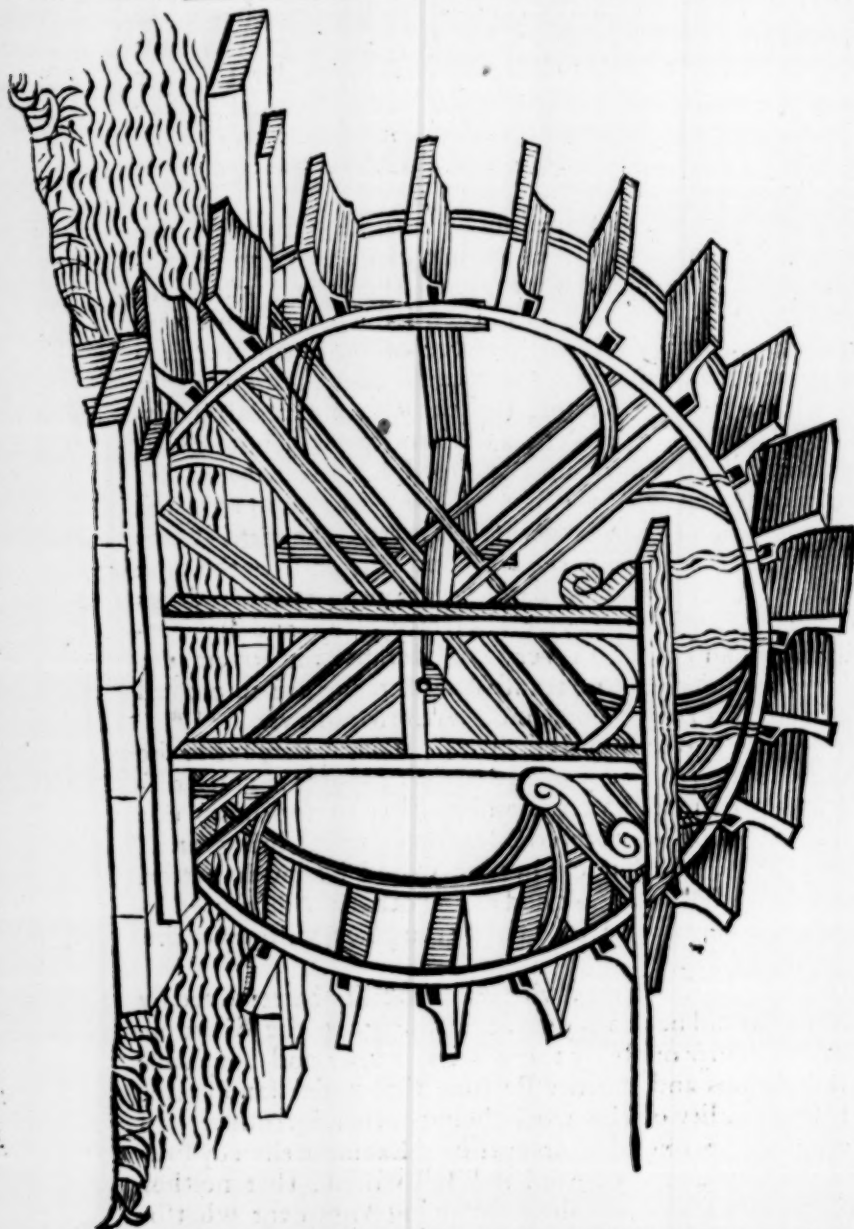
advantage of such Streams and Rivers, carrying in their bowels so much Wealth into the *Ocean*, when the *Mills* themselves yield not a tenth of the profit to the Owners that they hinder to their Neighbours, and their work may as well be performed by the *Wind* as by the *Water*; or at least the *Water* improved to a better advantage, by facilitating the Motion of the *Mill*; whereof more hereafter.

Thirdly, Another grand Impediment is the Ignorance of the *Country men*, who in many places are not capable of apprehending neither the Improvement, nor the cause thereof: But because some certain Neighbors of theirs had their Land overflown a long time, and was little the better, therefore will they not undergo that charge to so little purpose; Or because they are commonly possessed with a foolish opinion, that the *Water* leaves all its fatness on the Ground it flows over, and therefore will not advantage the next, which is most untrue; for I have seen Meadows successively drowned with the same *Water*, to almost an equal Improvement for many miles together. It is true, the *Water* leaves its fatness it hath washed from the *Hills* and *High-ways* in the time of great Rains: but we finde by daily experience, that Meadows are fertilized by overflowing as well in frosty, clear, and dry weather, as in rainy, and that to a very considerable Improvement; And also by the most clear and transparent Streams are improved ordinary Land, that they become most fertile Meadows.

Fourthly, From a greedy and covetous principle they suffer the *Grass* to stand so long on the watred Meadows, that it is much discoloured and grown so hawny, and neither so toothsom nor wholesom, as that on unwatered Meadows, which brings an ill name on the Hay; which if cut in time would be much better, and in most watred Meadows as good as any other; And the *After-grass* either to mow again, or to be fed on the place, will repay the former supposed Loss.

The former *Impediments* may with much facility be removed by a Law, which would be of very great Advantage to the Kingdom in general. The latter onely by the good *Examples* and *Presidents* of such industrious and worthy Persons that understand better things; the generality of the world being rather introduced to any ingenious and profitable Enterprise by Example than by Precept, although some are so sordid and self-willed, that neither apparent Demonstration, nor any convincing Argument whatsoever, can divert them from their *Byass* of Ill-husbandry and ignorance, whom we leave.

On the Borders or Banks of most Rivers or Streams, lye several Pieces of Land that are not capable of being overflown by the obstruction or diversion of the *Water*, without a greater injury than ^{of Meadows watered by Artificial Engines} the expected advantage would recompence; which may notwithstanding be improved very considerably, by placing of some Artificial Engine in, or near such River or Stream for the overflowing thereof.



The Persian Wheel.

Of the Persian
wheel.

The most considerable and universal is the *Persian Wheel*, much used in *Persia* from whence it hath its name, where they say there are two or three hundred in a River; whereby their Grounds are improved extraordinarily; They are also much used in *Spain*, *Italy*, and in *France*, and is esteemed the most facile, and advantageous way of raising Water in great quantity to any Altitude within the diameter of the Wheel, where there is any current of Water to continue its motion, which a small stream will do, considering the quantity, and height of the Water you intend to raise. This way, if ingeniously prosecuted, would prove a very considerable Improvement; for there is very much Land in many places lying near to Rivers that is of small worth, which if it were watered by so constant a stream as this *Wheel* will yield, would bear a good burthen of Hay, where now it will hardly bear Corn.

How

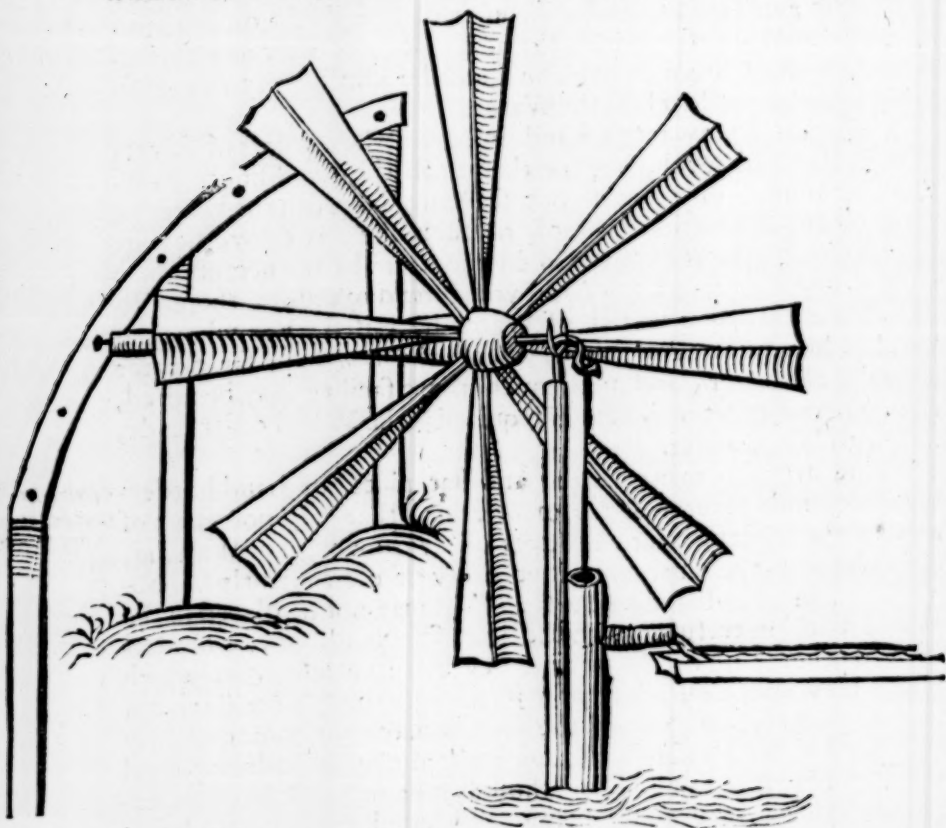
How many Acres of Land lie on the declining sides of hills by the Rivers sides, in many places where the Water cannot be brought unto it by any ordinary way? yet by this Wheel placed in the *River* or *Current*, and a Trough of Boards set on *Trestles* to convey the Water from it to the next place, of neer an equal altitude to the Cistern, may the Land be continually watred so far as is under the level of the Water.

Also there is very much Land lying on the borders of Rivers that is flat and level, yet neither doth the Land-floods overflow the same, or at most but seldom; Nor can the Water be made by any obstruction thereof, or such like way to overflow it. But by this *Persian Wheel* placed in the *River* in the neereft place to the highest part of the Land you intend overflow, therewith may a very great quantity of Water be raised; For where the Land is but little above the level of the *Water*, a far greater quantity of Water, and with much more facility may be raised, than where a greater height is required; the Wheel easier made, and with less expence.

There are also many large, and flat pieces of Land border-^{Of Wind-Eng-}ing neer unto several *Rivers* or *Streams*, that will not admit of ^{ines for the} any of the aforementioned wayes of overflowing, or Watring, ^{raising of Wa-} either because the *Current* cannot easily or conveniently be obstructed, or because such a *Persian Wheel* may not be placed in the Water without trespassing on the opposite Neighbor, or hinderance to others, or the Water not of force sufficient, &c. which places may very well admit of a *Wind-engine* or *Wind-mill* erected in such part thereof, where the Winds may most commodiously command it, and where the Land swells above the ordinary level you intend to *Water* or *overflow*, though it be remote from the *Current* or *Stream*, the Water being easily conducted thereto by an open or subterranean passage from the *Stream*; Such *Wind-mil* raising a sufficient quantity of Water for a reasonable height for many Acres of Land, must needs prove a very considerable advantage to the owner, as well for the overflowing thereof, as it hath done to many for the draining large Fens of great quantities of Water to a considerable height; Neither is it altogether necessary that such Land be wholly plain, and open to all Winds, for in Vallies that are on each side defended with Hills, or in such Lands that are on some sides planted with Woods, may such Wind-mills well be placed, where the Wind may at some certain seasons perform its work sufficiently, though not so continually as where the place is free to all Winds.

Several have been the Inventions of Ingenious men to accom-^{What Wind-}plish this design, and much have they promised to perform, ^{mills are best} some by the *Horizontal Windmil*, and by a Wheel with Buckets ^{for this work.} or Scoops fixed unto Chaines; Also by a Wheel carrying the Water up in Buckets fixed thereto, and casting the same forceably from it by the swiftness of its motion; Others by the perpetual Screw, which you may finde mentioned or delineated in Mr. *Bliths English Improver Improved*. But there is none seems to me

more feafable, lefs expensive, of longer continuance without repair or danger of Winds, nor more effectual to raife much Water with little Wind, than Vertical Sails like the ordinary Wind-mills,



only more in number and not so long, placed on an *Axis* of a length proportionable to the length of the *Vanes*; the one end resting on an Iron fork upon the top of a single post, the other end moveable to several points on a Quadrant of a Circle, that be the *Wind* which way it will, by only moving the one end of the *Axis* on the Quadrant, it will be direct to the one or the other side of the *Vanes* or *Sayls*, under the end of the *Axis* that rests on the single post; let there be a Pump placed in the Water you intend to raise, the head of the Pump not raising much above the place or passage to convey it away, which Pump may be made of what diameter you please, according to the strength of your Wind-mil, and height you raise the Water, you may make the trunk of the Pump round, or if you would have it large, than square may serve as well as round: let the Bucket always dip into the level of the Water, which prevents much trouble, and Injury to the work, let the handle of the Pump extend in length to the *Axis* of the Wind-mil, which must be made crooked to receive, and move the same, like unto the *Axis* of a *Cylers Grinding-stone*, or Dutch Spinning-wheel turned with the foot, which *Wind-mil* or *Engine* by any reasonable Gale of Wind will

raise

raise a very great quantity of Water (proportionable to its strength and height) with ease; being made for a very small charge considering other costly Engines, is composed of very few parts, and therefore requires the less repair, and is the less subject to damage by violent Winds, and is easily managed, and therefore the more suitable to our Country men, who usually reject any thing though never so excellent, if it be difficult.

Sect. 2.

The Principal Rules necessary to be observed in Overflowing or Drowning of Lands.

When you have raised or brought the Water by any of the ^{1 In cutting the main Carriage.} afore said means to the height you expected, then cut your main Carriage, allowing it a convenient descent to give the Water a fair, and plausible Current all along; let the mouth of the main Carriage be of breadth (rather than depth) sufficient to receive the whole Stream you desire, or intend, and when you come to use a part of your Water, let the main Carriage narrow by degrees, and so let it narrow till the end that the Water may press into the lesser carriages, that issue all along from the main.

At every rising ground or other convenient distances you ought ^{2 In cutting the lesser Carriages} to cut small tapering Carriages, proportionable to the distance and quantity of Land or Water you have, which are to be as shallow as may be, and as many in number as you can, for although it seems to waste much Land by cutting so much turf, yet it proves not so in the end, for the more nimbly the Water runs over the Grass by much the better the Improvement is, which is attained by making many, and shallow Carriages.

Another principal observation in Drowning, or Watering of ^{3 In making the Drains.} Lands, is to make Drains to carry off the Water the Carriage brings on, and therefore must bear some proportion to it, though not so large; and as the lesser Carriages conduct the Water to every part of your Land, so must the lesser Drains be made amongst the Carriages, in the lowest places to lead the Water off, and must widen as they run, as the Carriages lessened; for if the Water be not well Drained, it proves injurious to the Grass, by standing in pools thereon; In the Winter it kills the Grass, and in the Spring or Summer hinders its growth, and breeds Rushes, and bad Weeds, which if well drained off, works a contrary effect.

Some graze their Lands till *Christmas*, some longer, but as soon ^{4 Times for watering or drowning of Land.} as you have fed it bare, than is it best to Overflow: from *Alhollan-tide* throughout the Winter may you use this Husbandry, until the Spring that the Grass begin to be large: during *April* and the beginning of *May*, in some places may you give the Grass a little Water once a week, and it will prove wonderfully, especially in a dry Spring. In Drowning observe that you let not the Water rest too long on a place, but let it dry in the Intervals of times, and it will prove the better, nor let Cattel tread it whilst it is wet.

In the summer if you desire to water your Land, let it be in mild or Cloudy weather, or in the night time, that the Water may be off in the heat of the day, least it scorch the Grass, and you be frustrate of your expectation.

3 Manner of
Watering of
Land by small
streams or En-
gines.

In many places you may have the opportunity to command a small Spring or Stream where you cannot a larger, or may obtain Water by the Engines before mentioned, which may not be sufficient to overflow your Land in that manner, nor so much to your content as the greater Currents may, therefore you must make your Carriages small according to your Water, and let there be several stops in them, that you Water the one part at one time, and then another, also in such dry and shelving Lands where usually such small Springs are, and Water by such artificial waies advanced, a small drilling Water so that it be constant, worketh a wonderful Improvement.

6. Batten
springs not use-
ful.

In some places issue Springs whose Waters are sterile, and injurious to the Husbandman, as are usually such that flow from *Coal-mines*, or any *Sulphurous*, or *Vitriolin Minerals*, being of so harsh, and brackish a substance that they become destructive to vegetables; Not but that those Minerals, and also those Waters contain much of that matter which is the cause, and of the principles of vegetation, though not duely applied, nor equally proportionated, as much Urine, Salt, &c. kills Vegetables yet duely fermented, and artificially applyed, nothing more fertile; such Springs that you suspect prove them first before you goe to far, those that are bad are usually redish in colour, and leave a red sediment, and shine as it runs, and is not fertile untill it hath run far, and encreased it self from other Spings, and gained more fertility in its passage, as we usually observe greater Rivers though reddish in colour, yet make good Meadow.

Seet 3.

Of dry Meadow or Pasture.

Every place almost is furnished with dry Meadows which are convertible, sometimes into Meadows, and sometimes into Pastures, and such places much more where Waters, Springs, and Rivolets are scarce or the Rivers very great, or the Country hilly, that Water cannot so well be commanded over such Lands as in other places they may, which dry Meadows, and Pastures are capable of Improvement by several ways.

Improved by
Enclosure.

And principally by Enclosure, for where shall we finde better dry Meadows, and richer Pastures than in several hilly places of *Somersetshire*, among the small Enclosures, which not onely preserveth the young Grass from the exciccating Spring-winds, but shaddoweth it also in some measure from the Summer-scorching Sun-beams, as before we noted in the Chapter of *Enclosure*, such Meadows, or Pastures well planted with either Timber, or Fruit-trees in the Hedge-rows, or other convenient places, and enclosed in small parcels, will furnish you with good Hay, and good Pasture when your Neighbor whose Lands are naked goes without it, for dry Springs or Summers more usually happen than wet, besides the shaddow for your Cattel, and many other advantages as before we observed.

Burning of
Rusby and
Mossy ground.

In several places where the ground is moist, cold, clay, spewy, rusby or mossie, or subject to such inconveniencies, that the Pasture or Hay

Hay is short, sower, and not proveable, it is very good Husbandry to pare off the turf about *July* or *August*, and burn the same (after the manner as is hereafter described when we come to treat of burning of Land) and then plough it up immediately, or in the Spring following, and sow the same with Hay-dust or with Corn and Hay-dust together, for by this means, will that acid juice that lay on the surface of the Earth, which was of a sterile nature, and hindered the growth of the Vegetables, be evaporated away, and also the Grass which had a long time degenerated by standing in so poor a Soyl, be totally destroyed, and the Land made fertile, and capable to receive a better species brought in the Seed from other fertile Meadows.

It is too commonly observed that many excellent Meadows, or Pasture-land are so plentifully stored with Shrubs, small Hillocks, ^{Stubbing up of Shrubs, &c.} Ant-hills, or such like, that a good part thereof is wholly lost, and so much thereof as is mowen is but in patches here and there, and that that remains not so beneficial as if it were either mowen or fed together; Now the best way or Method of stubbing up such thorny Shrubs, or Broom, or Goss, or any such annoying Shrubs, which proves both laborious, and costly any other way than this, ingeniously delivered by *Gabriel Platt*; The Instrument ^{Discovery of bidden treasures} by him discovered is like a three-grained dung-fork onely, but much greater, and stronger, according to the bigness of the Shrubs, &c. The stale thereof like a large, and strong leaver, which Instrument being set half a foot or such reasonable distance from the Root of the Shrub, &c. then with a Hedging-beetle drive it in a good depth, then elevate the Stale, and lay some weight or fulcriment under it, and with a rope fastened to the upper end thereof, pull it down, which will wrench up the whole bush by the Roots: Also Ant-hills prove a very great annoyance to Pasture, and Meadow-lands, which may be destroyed by dividing the Turf on the top, and laying of it open several wayes, then take out the core, and spread over the other Land, and lay the Turf down neatly in its place again, a little hollowing in, and lower than the surface of the Earth, and at the beginning of the Winter the Water standing therein will destroy the remainder of the Ants, and prevent their return, and settle the Turf by the Spring, that by this means may a very great Improvement be made of much Meadow or Pasture land, now a great part thereof Bushes, and Ant-hills.

These Meadows, and Pasture-lands where the Water over-^{Dunging or Soyling of Meadows and Pastures.}floweth not at any time, are the onely places where you may lay your dung, or other Manure to the best advantage, it being not capable of being improved by Water, nor the Soyl laid thereon subject to be carried away, or at least the better part thereof extracted by the Water, either casually by floods, or any other way overflowing the same.

The best time for the Soyling of Meadows, and Pasture-lands ^{Time for Soyling.} is in the Winter season about *January*, or *February*, that the rains may wash to the Roots of the Grass the fatness of the Soyl, before

fore the Sun dryeth it away, and dissolve the clots that may be spread with a Bush drawn over it like a Harrow, before the Grasse be too high.

*Soyl for Rushy
and cold Land.*

Ashes of Wood, Peat, Turf, Sea-coal, or any other Fewel, is very proper to be laid on Cold, Spewy, Rushey, and Mossy Land (not Sandy or hot) and suits best therewith, and agrees with the Husbandry of burning the Turf, as before is advised: the dung of Pigeons, or any other Fowl, works a better effect on that than other Lands; also all hot and Sandy Soyls are fittest for that sort of Lands.

*For sandy or hot
Land.*

Lime, Chalk, Marle, or any cold fossile Soyls are an extraordinary Improvement to dry, Sandy, hot Lands of a contrary nature, or temperature, as well for Meadow and Pasture, as for Corn-Land; I have seen much of the blew Clay which they call *Urry* that's digged out of the Coal-mines, and lyes neer the Coal, laid on Meadow, and Pasture-lands, to a very considerable advantage: many instances of wonderful Improvements made by immixing of Soyls of contrary natures, you may find in several of our modern *Rural Authors*.

*For other Mea-
dows.*

Between these two extreems your ordinary dung or Soyl is best bestowed on your Meadows, and Pastures, not so much inclining either way, for it is a very principal part of good Husbandry to apply the Soyl, or Compost, properly as the nature of the ground requireth, whereof you may finde more hereafter in the Chapter of Soyls, Dungs, &c.

Sect. 4.

Of several new species of Hay or Grass.

It is found by daily experience not onely in forreign parts but in our own Country, that a very great Improvement may be made on the greater part of our Lands, by altering the species of such Vegetables that are naturally produced, totally suppressing the one, and propagating another in its place, which may rejoyce, and thrive better there than that before, as we evidently see by Corn sown on Land where hardly Grasse would have grown, what a Crop you reap: but these are but Annuals, that which raises the greatest advantage to the Husbandman, is what annually yields its increase without a renovation of expence in Ploughing, and sowing, as we finde in the Clover-grass or great Trefoyl, Saint Foyn, or Holy-hay, La Lucern, Spurry-seed, Trefoyl, &c. whereof a part.

*Of the Clovtr
Grass.*

This Grass hath born the name, and is esteemed the most principal of Grass, both for the great Improvement it brings by its prodigious Burthen, and by the excellency of the Grass or Hay for food for Cattel, and is much sown, and used in *Flanders*, and in *Holland*, Presidents to the whole world for good Husbandry.

In

In *Brabant* they speak of keeping four Cows Winter and Summer on an Acre, some cut and laid up for Fodder, others cut and eaten green: here in *England* they say an Acre hath kept four Coach-horses and more all Summer long, but if it kept but two Cows it is advantage enough upon such Lands as never kept one. You may mow the first Crop in the midst, or end of *May*, and lay that up for Hay, if it grow not too strong it will be exceeding good and rich, and feed any thing, then reserve the next for Seed, which may yield four Bushels upon an Acre, each Bushel being worth three or four pound a Bushel, which will amount to the reputed value of ten or twelve pounds *per Acre*, and after that Crop also it may be fed: It hath also this Property, that after the growing of the *Clover-Grass* three or four years, it will so frame the Earth, that it will be very fit for Corn again, which will prove a very great Advantage, and then again for *Clover*. Thus far Mr. *English* *im-*
Blith. Others say it will last five years, and then also yield three *prover.*
or four years together rich Crops of Wheat, and after that a Crop of Oats.

In the Annotations upon Mr. *Hartlib's Legacy* we finde several Computations of the great Advantage hath been made by sowing *Clover-grass*, as that a parcel of Ground a little above two Acres, the second year did yield in *May* two Load of Hay worth five pounds, the next Crop for Seed was ripe in *August*, and yielded three very great Loads worth nine pounds that year, the Seed was 300 l. which with the Hay was valued at thirty pounds, besides the after Pasture. Another President is, that on four Acres there grew twelve Loads of Hay at twice mowing, and twenty Bushels of Seed; one Load of the Hay mown in *May* being worth two Load of the best of other Hay, and the After-pasture three times better than any other; the four Acres yielded in one year fourscore pound. Another, that six Acres of *Clover* did maintain for half a year thirteen Cows, ten Oxen, three Horses, and twenty six Hogs, which was valued at forty pound, besides the Winter Herbage.

The aforesaid Presidents and Valuations seem prodigious, unless a rich, light Land, warm and dry, be sown therewith, in which it principally delighteth, and then it may probably answer the said Valuations, and must needs be a very high Improvement, although the Ground were good and profitable before. It will also prosper and thrive on any Corn Land, well manured or soyled and brought into perfect Tillage. Old Land be it course or rich, long untilld is best for Corn, and best and most certain for *Clover-Grass*; and when you have Corned your Land as much as you intend, then to sow it with *Clover* is the properest season: Land too rich for Corn, cannot be too rich for *Clover*. Poor Lands are not fit for *Clover*, unless burnt or denshired, as we shall hereafter direct; or limed, marled, or otherwise manured, and then will it bring forth good *Clover*. The best Land for Clover-grass.

An Acre of Ground will take about ten pounds of your *Clover-Grass* Seed, which is in measure somewhat above half a peck, according Quantity of Seed for an Acre.

cording to Sir *Richard Weston*. The quantity of Seed for an Acre Mr. *Blith* conceives will be a Gallon, or nine or ten pound, which agrees with the other: But if it be husky (which saves labour in cleansing of it, and also sows better by filling the hand, than mixed with any other thing) you must endeavor to finde out a true proportion according to the cleanness or foulness you make it, but be sure to sow enough, rather too much than too little; for the more there is the better it shadows the Ground: Some have sown fifteen pound on an Acre with good success; ten pound some judge to be of the least, however let the Seed be new and of the best, which the English is esteemed to be.

The time and
manner of sow-
ing Clover-
Grass

The usual way is thus advised: when you have fitted your Land by Tillage and good Husbandry, then sow your *Barley* and *Oats* and harrow them, then sow your *Clover-grass* upon the same Land, and cover it over with a small Harrow or Bush, but sow not the Corn so thick as at other times the Land usually requires. The principal seasons for the sowing thereof are the end of *March*, and throughout *April*. Sir *Richard Weston* adviseth to sow the *Clover-seed* when the *Oats* begin to come up; also that you may sow it alone without any other Seed or Grain, and that it will be ready to cut by the first of *June* the first year. It is also observed that *Polish Oats* are the best Corn to be sown with *Clover* about the middle of *April*: two Bushels and a half, or three Bushels to an Acre, which will yield a middle Crop of *Oats* at Harvest, and shadow the *Clover* from the heat of the Sun, which will be a notable Pasture in *September* or *October* following.

Of cutting it
for Hay and
for Seed.

About the midst or end of *May*, may you cut the first Crop for Hay, which takes up more time and labour to dry it than ordinary Hay, and will go very near together, yet if it grow not too strong it will be exceeding rich and good, and feed any thing. The exact time of cutting is when it begins to knot, and then will it yield good Hay, and ere the year be about it may yield you three such Crops, and afterwards feed it with Cattel all the Winter, or until *January*, as you do other Ground: But if you intend to preserve the Seed, then you must expect but two Crops that year; the first Crop as before, but the second must stand till the Seed be come to a full and dead ripeness, for it will not be very apt to shed; When first you can observe the Seed in the Husk, about a moneth after it may be ripe, and then the Seed begins to change its colour, and the Stalk begins to die and turn brown, and being turned to a yellowish colour in a dry time mow it, and preserve it till it be perfectly dry. In some years it ripens sooner than in other, therefore you need not be precise as to the time, but to the ripeness of it. The Stalks or Haws after you have thrashed out your Seed, Cattel will eat, but if they be too old and hard that they will not: Some direct to boyl them, and make a Mash of them, and it will be very nourishing, either for Hogs, or any thing that will eat thereof. Others reject the Stalks as uselesse, and esteem the Seed onely to be a sufficient Advance of that Crop.

Sir *Richard*
Weston.

One Acre of this *Grafs* will feed you as many Cows as six Acres of other, and you will finde your Milk much richer, and exceeding much in quantity, and fattens very well: The best way of feeding of it, and as is reported, 'tis the usual way in *Holland* and *Flanders*, is to cut it daily as your Cattel spends it, and give it them in Racks, under some Trees, or in some Shed or Out-house, for the Cattel will injure it much with their feet, it being a gross sort of Vegetable: Unless you mow it for the Seed, the best husbandry is to graze it, or feed it in Racks, because it is so excellent a Food green, and shrinks so much in the drying. Swine will grow fat with what falls from the Racks. It is not good to let Cattel that are not used to this Food, eat too liberally of it at the first, for I knew a Yoke of Oxen put hungry into a Field of *Clover-Grafs*, where they fed so heartily on this sweet Food, that one immediately died through a meer Surfeit, the other with difficulty preserved; therefore some prescribe to give them a little Straw mixed therewith at the first, or to dyet them as to the quantity, may do as well.

It being preserved thoroughly dry, about the middest of *March* thrash it, and cleanse it from the Straw as much as you can, then beat the Husk again, being exceeding well dried in the Sun after the first Thrashing, and then get out what Seed you can; Or after you have thrashed it, and chaved it with a fine Rake, and sunned it in a hot and dry season, if you will then rub it, you may get very much out of it; some have this way got above two Bushels out of an Acre; Sir *Richard Weston* saith you may have five Bushels from an Acre.

He is a good Thrasher that can thrash six Gallons in a day, and after the second Thrashing, drying, and winnowing, or chaving, it is confidently averred that it may be purely separated from its Husk by a Mill, after the manner as Oatmeal is separated from the Chaff, and that at a very easie rate: But it is also experimented that our own Seed sown in the Husk hath proved the best, thicker, and certainer than that sowed of the pure Seed it self, otherwise you must be forced to mix therewith ashes of Wood, or Coals courly sifted; or with Saw-dust, or good Sand, or fine Mould, or any thing else that will help to fill the hand, that you may sow it evenly, and with a full hand.

Of *St. Foy*.

This *St. Foy*, or *Holy-hay*, hath in several places of *England*, obtained the preference above *Clover-Grafs*, for that it thrives so well, and is so great an Improvement on our barren Lands, where the other will not; it being also natural to our timorous Rusticks not to hazard Land that will yield them any considerable advantage any other way, on any new method of Husbandry; but if they have a Corner of Land that is of little use to them, they will perhaps bestow a little Seed on it, and but few of that minde neither: Then it continues longer in proof than *Clover-Grafs*, which

wears out in a few years, this continues many, which is a daily provocation to the sloathful to go so near and plain a way, when so long time trodden before his face. In *Wiltshire* in several places there are Presidents of *St. Foyn*, that hath been these twenty years growing on poor Land, and hath so far improved the same, that from a Noble per Acre, twenty Acres together have been constantly worth thirty shillings per Acre, and yet continues in good proof.

On what Land
to sow it.

If it be sown on the poorest and barrenest Land we have, it will thrive, and raise a very considerable Improvement; besides it meliorateth and fertilizeth the Land whereon it hath stood for many years, and not barrenizeth it as is usual with Annual Seeds. You may break it up, and sow it with Corn till it be out of heart, and then sow it with *St. Foyn* as formerly: it will thrive on dry and barren Grounds where hardly any thing else will; the roots being great and deep are not so soon dried by the parching heat of the Sun, as of other Grasses they are.

Quantity of
Seed on an
Acre, and man-
ner of sowing
of it.

It must be sown in far greater quantity than the *Clover Seed*, because the Seed is much larger and lighter: It may be sown with *Oats* or *Barley*, as the *Clover*, about equal parts with the Grain you sow it will serve, always remembering you sow your Grain but thin. Be sure you make your Ground fine for this, and other *French Seeds*, as you usually do for *Barley*; Fear not the sowing of the Seeds too thick, for being thick they sooner stock the Ground, and destroy all other Grasses and Weeds. Some advise to hove these Seeds in, like Pease, in Ranges, though not so far distant, the better to destroy the Weeds between it: this will bear this way of husbandry better than the *Clover*, because that hath but a small Root, and requires to shadow the Ground more than this. Feed it not the first year, because the sweetness thereof will provoke the Cattel to bite too near the Ground, very much to the injury of your *St. Foyn*; but you may mow it with your *Barley* or *Oats*, or if sown by it self, the first year.

Of La Lucerne.

What Ground
it requires.

In the next place this Plant *La Lucerne* is commended for an excellent Fodder, and by some preferred before *St. Foyn*, as being very advantageous to dry and barren Grounds. It is managed like the former Seeds: Some write that it requires a moist Ground and rich, others a dry, so that we may conclude it hath proved well on all: The Land must be well dressed, and three times sowed.

Time and man-
ner of sowing
of it.

The time for sowing of it, is after the cold Weather be over, about the middle of April; some *Oats* may be sown therewith, but in a small proportion; the Seed is very small, therefore the first part of it is allotted to an Acre, as is required of any other Grain one Bushel thereof going as far as six of Corn: It may be mown twice a year, and fed all the Winter; the Hay must be well dried and houled, for it is otherwise bad to keep. It is good for all kinde of

Its use.

Cattel,

Cattel, but above all it agreeth best with Horses; it feedeth much more than ordinary Hay; that lean Beasts are suddenly fat with it, it causeth abundance of Milk in Milch-beasts. It must be sown at the first with caution as before we directed concerning the Clover, that is mixed with Straw or Hay. You may also feed all sorts of Cattel with it green all the Summer; it is best to mow it but once a year: it will last ten or twelve years. If you desire the Seed when it is ripe, cut off the tops in a dewy morning, and press into sheets for fear of loosing the Seed; and when they are dry, thrash them thereon; the remaining Stalks may be mowed for Hay. By eating this Grass in the Spring, Horses are purged and made fat in eight or ten days time. One Acre will keep three Horses all the year long. *Hartlib's Legacy.*

Sect. 5. *Of some other Grasses for Hays.*

This is a kinde of *St. Foy*; and by some judged to be the same. This is a Grain, annually sown in *France* and other Countreys, very quick of growth, and excellent food for Cattel; especially for Horses, and after the feeding of it the summer part of the Summer, it may be let grow for Hay. It is not so good as *La Lucerne*, because this is annual, the other of long continuance, only this will grow on drier and poorer Land than *Lucerne*; where it doth exceed it.

In the Low Countreys they usually sow it twice in a Summer; the first in May, in June and July it will be in Flower, and in August the Seed is usually ripe.

The second time of sowing is after Rye-harvest, which Grounds they usually plough up, and sow it with Spurrey-seed, that it may grow up and serve his Kine, (after all late Grasses be eaten up) till New-years-day. This Pasture makes excellent Butter, preferred by many before May-butter. Hens will greedily eat the Herb, and it makes them lay the more Eggs. *Hartlib's Legacy.*

Hop Clover, Trefoyl, or Three-leaved Grass is both finer and sweeter than the great Clover-Grass; it will grow in any Ground, it may be sown with Corn (as before) or without, or being sprinkled in Meadows will exceedingly mend the Hay, both in burthen and goodness. *Tisfoyl.*

At Maddington in Wiltshire about nine miles from Salisbury, grows a Grass in a small Plat of Meadow-ground, which Grass in some years grows to a prodigious length, sometimes twenty four foot long, but not in height as is usually reported, but creeping on the ground, or at least touching the ground at several of the knots of the Grass. It is extraordinary sweet, and not so easily propagated as hath been imagined; the length thereof being occasioned by the washing of a declining Sheep-down, that the Rain in a hasty shewre brings with its much of the fatness of the Sheep-dung over the Mead; so that in such Springs that are

are not subject to such showres, or at least from some certain Coasts this Grass thriveth not so well, the Ground being then no better than other.

Saxifrage.

This *Herb* so little esteemed (because not far fetched) is an excellent and proper *Herb* to be nourished or sown in Meadows, for amongst all House-wives it is held for an Infalible Rule, That where *Saxifrage* growes, there you shall never have ill Cheefe or Butter, especially Cheefe; whence it cometh that the *Netherlands* abound much in that Commodity, and onely as is supposed, through the plenty of that *Herb*.

These and many other most rare and excellent Plants there are, which if they were advanced or propagated that they might openly manifest their worth, might be of much more advantage to the Laborious Husbandmen, than the short, sowre, and naturally wilde and barren Grass, mixed with a superabundant proportion of pernicious Weeds; Therefore it would be very acceptable service to the whole Nation, if those that have Land enough would yearly prove some shall proportion of these and other *Vegetables*, not yet brought into common use: By which means they would not onely advance their own Estates, but the whole Nation in general, and gain unto themselves an Everlasting Fame and Honor, as did the Families of *Piso*, *Fabius*, *Lentullus*, and *Cicero*, by bringing into use the several Pulses, now called by their Names.



CHAP. IV.

Of Arable Land and Tillage, and of the several Grains, Pulses, &c. usually propagated by the Plough.

IN greatest Esteem, and most worthy of our Care, is the Arable Land, yielding unto the Laborious Husbandman the most necessary Sustainment this Life requires, but not without industry and toyl: The Plough being the most happy Instrument that ever was discovered; the Inventor of the use whereof was by the Heathens celebrated as a Goddeſs.

*Prima Ceres ferro mortales vertere terram
Instituit. ---*

Virgil.

But of the Plough it self *Triptolemus* is said to have invented. ^{Pliny.} This Art was always in esteem, as before in the Preface we have shewn, and from this part thereof, being the most principal, doth it take its Name of *Agriculture*, from the Tilling of the Land with the *Plough*, or with the *Spade* the more ancient Instrument, though not more necessary and beneficial: And since its first Invention hath there been many several Improvements made of it for the more facile and commodious use thereof, and every day almost, and in every place doth the Ingenious *Husbandman* endeavor to excel the slothful in this most necessary Art, that from a burthensom and toylsome labor, it is in some places become but a pleasing and profitable Exercise, and its hoped that by those Presidents and Examples, the more Vulgar will be provoked to a more universal use of that which is best and most advantageous to themselves, as well as the publick. More of this Instrument see hereafter in this Treatise.

SECT. I.

What Lands improved by Tillage.

Non omnis fert omnia tellus, Every sort of Land almost requires a different Husbandry, some Grounds producing plenty of that which on another will not grow. This is none of the meanest part of the Husbandmans skill to understand what is most proper to be propagated on each sort of Land; the strong and stiff ground receiving the greatest Improvement from the Plough; and the mellow, warm, and light, from other Plantations of Fruits, &c.

Densa magis Cereri, rarissima quaque Lyzo.

Virgil.

Although the best, warmest, and lightest Land yields most excellent Corn, yet the other sorts of Lands yield not so good Fruits, Plants,

Plants, Grasse, Hay, &c. also necessary for the Husbandman, therefore our principal design must be to appropriate each sort to that Method of Husbandry most natural unto it; That where the nature of the Land differs, which it usually doth in the same Parish, and many times in one and the same Farm, and sometimes in the same Field, that there, there may be used a different way. We have before discoursed of what Lands are fittest for *Meadows*, and *Pastures*, and now shall give you those Directions I finde, to know what is most proper for the *Plough*.

The strong and stiff, as we said before, and also the cold and moist, and that which lies obvious to the extremities of cold or heat, as is most of the Champion or Field-land, for there may be sown such Seeds that naturally affect such places, until they are reduced and better qualified by Enclosure, the first and main principal of Improvement: Also mossie and rusty Grounds are much improved by ploughing, and Grounds subject to pernicious Weeds may be much advantaged, by destroying the Weeds, and propagating good Corn or other Tillage in the room thereof.

The manner of
ploughing or
husbanding
each sort.
Clay, stiff, cold
and moist.

All clay, stiff, cold, and moist Grounds are generally thrice ploughed, in the *Spring*, *Summer*, and at *Seed-time* for Wheat, and four times for Barley, if it be the first Grain sown after long resting, which in most places is not usual. These several Ploughings or Fallowings are very advantagious to Ground in several respects.

1. It layeth the Ground by degrees in Ridges in such order as the nature thereof requireth; for the more in number, and the higher the Ridges, the better they are for Wheat, which naturally delighteth in a moist Ground, so that it be laid dry, that is, not subject to be drowned or over-glutted with water in moist years: And this Method of laying the Ridges, much prevents the blasting of Wheat; for Wheat is easily over-charged with Water, either in *Winter* or *Summer*.

2. This often stirring the Land makes it light and fitter for the Seed to take root therein, the Clods being apt to dissolve by being exposed to the weather, and often broken by the Plough.

3. It kills the weeds which in strong Lands are apt to over-run the Corn.

4. It fertilizeth Land: The *Sun* and the *Sull* are some Husbandmens Soyl. *Virgil* also seems to hint as much where he saith,

Pingue solum primis exemplo a mensibus Anni

Fortes invertant Tauri; glebasque jacentes

Pulverulenta coquat maturis solibus aestas.

5. It defends the Corn much from the extremities of Weather, especially cold Windes, for the more uneven any Piece of Land is, the better it bears the extremities of the *Winter*; for which reason in the open Champion where the Land is dry, and they do not lay up their Ridges as in other places, yet they harrow it but little, and leave it as rough as they can, for no other cause but to break the fleeting Winds. The Gardiners near *London* now seem to imitate this practise, by laying their Gardens in Ridges, not onely

onely the better to shelter their Seeds from the cold Windes, but also to give it an advantage of the Sun, as I my self proved it many years since, that Pease sown on the South side of small Beds, so raised that they seemed to respond to the *Elevation* of the Pole, prospered well, and passed the *Winter* better, and were much earlier in the *Spring*, than those otherwise planted.

But in case you intend to sow *Barley* first therein, after the third Fallowing, it must lye over the *Winter*, that the Frosts may the better temper it for the Seed-time, when it is to be ploughed a gain; If for Pease or Beans, once Fallowing before *Winter* serves the turn.

If it hath a good *Sward* or *Turf* on it, I rather advise you to *denfbire* or burn it the Summer before you sow it; this is the more expeditious and advantagious way, it spends the Acid moisture (an enemy to Vegetation) it kills the weeds, and brings the Land quickly to a fine light temper.

Other sorts of Land improveable by the *Plough*, are very good rich, mixed Land, and of a good black mould,

Nigra fere & pinguis ---

Optima frumentis ---

Rich and mel-
low Land.
Virgil,

Or of any other colour that hath lain long for Pasture, till it be over-grown with Moss, Weeds, or such like, which will as soon grow on rich Lands as poor: To these Lands *Ploughing* is not onely a Medicine or Cure, but raiseth an immediate Advantage, and much benefiteth the Land for the future, in case you take but a Crop or two at a time, and lay it down for Pasture again well soyled, or else sown with some of the New *Grasses* or *Hays* before named; but if not, yet onely by soying it the year before you lay it down, it may yield a very good Grass after the Corn is carried off, and soon come to a Sward. The Land is to be laid in height according as it is inclinable to Moisture or Drought. New broken Ground if it be sown with Pease the first year, saves one ploughing, and a good part of the Herbage the Summer before; it also destroys the weeds, and better prepares the Land for any other Grain.

In every part of *England* there is much Waste Land, and other old Pastures that bears the name of Barren Land, although for the most part by good husbandry it may be reduced into Tillage, and become very fruitful and advantagious to the Husband-man in particular, and Commonwealth in general; As is evident in many particular parcels lately Enclosed, and taken out of the supposed barren Heaths and Commons, that are now fruitful Fields; therefore before any thing considerable can be effected to the Improvement and right Ordering of these sorts of Land, the Design of Enclosure ought to be seriously prosecuted; but for such that are already Enclosed, and yet remain barren and unfruitful, it is a manifest sign of the ill management of the Proprietors, or that the Tenant in possession hath but a short time, or that he is obliged not to alter the nature and order of the Ground; or (which is too common) that the present charge of good Husbandry, ex-

Poor and bar-
ren Land.

ceeds an ill Husbands Store : His poor and beggarly Farm hath wasted what he hath, and he has no more to try new Conclusions withal ; And in this condition is abundance of Land in this Kingdom barren Land, poor Cattel, and bad Corn, do insensibly as it were devour us, because once in five or seven years in a very wet Summer, or such like, when the rich Vales suffer, these barren Lands yield a considerable Advantage, which as a Lottery, encourages us to beggary.

The best and speediest way to reduce these Lands that have long lain untilld, and that have a Sward either of sowre Grasse, or of Rushes, Weeds, or such like, or of heathy Goss, Fearn or Broom, by which means they have contracted an evil Juice, injurious to Vegetation, and withal a fertile Terrestrial Salt ; the best way, I say, to improve and reduce these Lands into Tillage, is to burn-bait, or denshire them, as is hereafter shewn, which way is used on the barrenest and poorest Lands in *England*, or *Wales*, where before hardly any thing would grow, now will grow as good Wheat or other Grain, as on the best Land you have. Many presidents hereof there are in several places of *England*, where in two or three years, by this onely means the Husbandman gains as much above all expence, as the purchase of the Land was worth before. Observe onely this Caution, That you be not too greedy to sow it so often till you have drawn out the heart of the Land, which then it will easily yeild, that it must lye rested many years, to gain a Sward again ; Nor that you expend the Soyl made of the Straw, on other Lands ; which ill Husbandry is generally used, that it brings an ill name on this part of Improvement ; which if well soyled and laid for Pasture, after two Crops will yeild a very good Grasse, as I have seen experienced, or else may be sown with new Flays or Grasses.

Sect. 2.

Of Digging of Land for Corn.

The *Spade* seemes to contend with the *Plough* for Antiquity, and is the common opinion, that it was in use before it ; The *Spade* being the more plain and simple Instrument, and withal the laborious. The *Plough* seeming to be an *Invention* for expedition, ease and advantage, to which generally all *New Inventions* should tend ; but that now at last the *Spade* should supplant the *Plough*, I see no reason, for as the *one* is necessary & useful for the better propagating of Plants that take deep root, so is the *other* as necessary and profitable for such that root more shallow, as Corn and Pulse usually do ; Other differences seem to be in the loosening and tempering the ground for the Seeds the better to extend, and spread their Roots, and for the better burying and destroying the Weeds ; These seem to be of greater Importance than the depth only, but all these by a Judicious and Industrious Husbandman are remedied and performed by the *Plough* as well as by the *Spade* ; for if the depth of the mould will bear it, or the nature

nature of the Seed you sow requires it; a *Double Plough*, the one ^{Deep ploughing as good as digging.} succeeding the other in depth, may be made; or the labor may be performed by two Ploughs, the one following the other in the same Furrow; but if a *Plough* be Artificially made, and set to work deep, although you plough the less in a day, it will stir the Land deep enough for any of our usual *Grain* or *Pulse*: And as for breaking or tempering the Land, and destroying the Weeds, ploughing and cross ploughing at several seasons will do more, and at less expence, than once digging can do; And if you please you may draw over the same (before your last ploughing) a large kinde of Harrow very heavy, or with a sufficient weight on it, which in some places is usually called *Dragging*. This extremity is onely necessary in some sorts of stiff Land, other lighter is much more easily managed. Mr. Platt in his *Adams Tool Revived*: or, *His New Art of Setting Corn*, where he so much contends for the *Spade*, gives this instance of the *Plough*, That a parcel of Land first cross ploughed with a deep-cutting *Plough*, and then ploughed over the third time with a shallow *Plough*, that made very close and narrow Furrows, then was the Seed sown by a skilful Sower, and then harrowed over, yielded fifteen quarters on each Acre so Tilled and Sown. I presume if this Relation may upon experience prove true, that none will be so much conceited of a Novelty, as to desert this Method of *Agriculture*, for that tedious and costly way of the *Spade*: But in case it doth not Annually amount unto such a prodigious increase as this *President*, yet doth it plainly evidence that good *Culture* doth infinitely meliorate the Land, and advance the Crop, and manifoldly repay the expence and labor bestowed thereon; which is the most you can expect of the *Spade*.

Sect. 3.

Of the different Species of Grain, Corn, Pulse, &c. usually sown, or necessary to be propagated in our Countrey Farms.

There is not any Grain more universally useful and necessary ^{wheat.} than *Wheat*, whereof there are several sorts, some more agreeable and better thriving on some sort of Land than on other, that it conduceth much to the Husbandmans advantage rightly to understand the natural temper of his Land, and what species of *Grain*, and particular sort of such Grain best agreeth with the nature of his Land; As some sorts of Land bear *Pulses* better than *Corn*, and some bears *Barley* better than *Wheat*, and some sorts of *Wheat* prove better on cold stiff Land, than on hot or dry, &c. We find many sorts of *Wheat* mentioned in our *Rustick Authors*, as *Whole Straw-wheat*, *Rivet-wheat*, white and red; *Pollard Wheat*, white and red, great and small; *Turkey-wheat*, *Purkey-wheat*, *Gray-wheat*, *Flaxen-wheat*: I suppose the same in some places called *Lammas-wheat*, *Chilter-wheat*, *Ograve-wheat*, *Sarajins-wheat*, with several other Names, though its probable may be the same sorts. The *Great Pollard* they say delights best on stiff Lands, and so doth the *Ograve*; *Flaxen-wheat* and *Lammas* on indifferent Land, and *Sarajins-wheat* ^{Kindes of wheat.}

on any; But what the different natures of these and other several sorts are, and in what Land they most principally delight, and the differences of their *Culture*, I leave to the more ingenious and expert Husbandman to finde out, and discover.

It is observed that the *Bearded Wheat* suffereth not by *Mildew*, because the Beard thereof is a kinde of defence to preserve it from Dew. *Wheat* is usually sown in the *Autumn*, and best in a wet season, *Triticum luto*, *bordenum pulvere conserite*, and either earlier or later as the nature of the Land, and scituation of the place requires.

Barley.

This is another very necessary Grain, though usually converted to the worst use of any that grows in *England*: It is the principal Ingredient into our necessary Drink moderately used, but the use thereof in excess is become the most general raging Vice, and as it were the *Primum Mobile* to most other detestable Evils. It is also a Bane to Ingeniuty, many of our best *Mechanicks* being too much addicted to the tincture of this Grain; nevertheless it so naturally delights in our meaner sort of Land, and in the Champion Countreys, that its become a principal part of the Countrey-mans Tillage, that the too great a quantity thereof doth impede the propagation of several other Grains and Pulses much more necessary; Neither know I any way to remedy this Neglect on the one side, and Wilfulness on the other, unless the Design of *Enclosure* might take effect, for then would the Lands be so much the more enriched, that they would bear other Grain, to a greater advantage to the *Husbandman* than Barley; or that a double or treble Tax might be imposed on every Acre of Barley-land, for what it is on other Grain, which would provoke the *Husbandman* to that which would be most for his Advantage, then would there be a greater plenty of all other sorts of Grain and Pulse, and at a lower price, and onely good Liquor a little the dearer, which may by House-keepers the easier be born withal.

The Seasons for sowing of *Barley* differ according to the nature of the Soyl, and scituation of the Place; Some sow in *March*, some in *April*, others not until *May*, yet with good success; no certain Rule can be herein prescribed, it usually proves as the succeeding Weather happens, onely a dry time is most kindly for the Seed.

Difference of
Barley.

There is little difference observed in *Barley*, onely there is one sort called *Rath-ripe Barley*, which is usually ripe two or three weeks before the other, and delights best in some sorts of hot and dry Land.

Rye.

This is a Grain generally known, and delighteth in a dry warm Land, and will grow in most sort of Land so that the Earth be well tempered and loose, it needeth not so rich a Ground, nor so much care nor cost bestowed thereon, as doth the *Wheat*, onely it must be Sown in a dry time, for Rain soon drowneth it, they usually say a shower of Rain will drown it in the hopper; Wet is so great an Enemy to it. It is quick of Growth, soon up after it is sown, and sooner in the Ear, usually in *April*, and also
sooner

sooner ripe than other Grain; Yet in some places is it usual to ^{M. B. A.} sow *Wheat* and *Rye* mixed, which grow together, and are reaped together; but the *Rye* must needs be ripe before the *Wheat*; Neither can I discover where a greater advantage lyes in sowing them together, than in sowing them apart. The principal season of sowing of *Rye* is in the *Autumn* about *September*, according as the season permits and the nature of the Ground requires.

Oats are very profitable and necessary Grain, in most places of ^{Oats.} *England*, they are the most principal Grain Horses affect, and commended for that use above any other; On such Lands that by reason of the cold no other Grain will thrive, yet *Oats* grow there plentifully, as many places in *Wales* and *Darbyshire* can witness; there is no ground too rich nor too poor, too hot, nor too cold for them, they are esteemed a peeler of the Ground, the best season for sowing of them is in *February*, or *March*; The white Oat is the best and heaviest Grain; The *Meal* makes good bread and much used for that purpose in many places, and also good Portage, and several other Messes, and is in great request towards *Scotland*, and in *Wales*; *Oaten Malt* also makes good *Beer*.

It is a Grain exceeding advantageous on barren sandy Lands, ^{Buck-wheat, or French-wheat.} it is much sown in *Surrey*, much less than any other Grain sownes an Acre, it is usually sown, as *Barley*, but later, it is also late ripe, and yeilds a very great increase, and is excellent food for swine, Poultry, &c. after it is mowen it must ly several dayes till the stalks be withered before it be housed; Neither is there any danger of the seed falling from it.

Our Rustick Authors mention several other sorts of Corn or ^{Other sorts of Grain.} Grain, as *Zea* or *Spelt-corn*, *Far*, *Millet*, *Sesame*, *Rice*, &c. which I shall forbear to particularize on, until we are better satisfied of their natures and use, and experienced in the way or method of their propagation.

Of all Pulses that are sown or propagated, ^{Pease.} *Pease* claim the preheminance, not onely for their general use both by Sea and Land, both for man and beast, but also for the diversity of their kinds; Almost for every sort of Land and for every season a different sort of *Pease*, some are white *Pease*, some gray, green, &c. not necessary here to be enumerated, every understanding Husbandman knowing what sorts best accords with his Land; In a stiff, fertile Ground they yield a very considerable Crop, without such frequent Fallows as other Grains requires, and destroy the Weeds, and fit and prepare the Land for After-crops, being an Improver, and not an Impoverisher of Land, as Husbandmen usually observe.

This also is of general use and benefit, and placed before any ^{Beans.} other *Pulses* by *Pliny* for its commodiousness both for man and beast, yet we finde the *Pease* to be more universally propagated. Of *Beans* there are several sorts, the *Great Garden-Beans*, and middle sort of Bean, and the small Bean, or *Horse-bean*; The latter onely is usually sown in *Ploughed-Lands*, and delights principally in stiff and strong Ground, and thrives not in light, sandy, or barren;

ren ; They are proper to be sown in Land at the first breaking up, where you intend afterwards to sow other Grain ; because they destroy the Weeds, and improve the Land, as generally doth all other *Cod-ware*. Of the other sorts of *Beans*, and also of *Pease*, we shall say more hereafter in this *Treatise*.

Fetches.

The *Citch* or *Fetch*, whereof there are several sorts, but two of most principal Note ; the *Winter* and *Summer Fetch* ; the one sown before *Winter*, and abiding the extremity of the *Weather* ; the other not so hardy, and sown in the *Spring*, they are much sown in some places, and to a very considerable Advantage ; they are a good strong and nourishing food to Cattel, either given in the *Straw* or without, and are propagated after the manner of *Pease*.

Lentils.

The least of all *Pulses* is the *Lentill*, in some places called *Tills* ; It is sown in ordinary ground, and requires it not very rich. Of a very few sown on an Acre, you shall reap an incredible quantity, although they appear on the Ground but small, and lye in a little room in the Cart : they are a most excellent sweet Fodder, and to be preferred before any other Fodder or Pulse for Calves, or any other young Cattel.

Lupines.

This *Pulse*, though not used in this Countrey as ever I could understand, (unless a few in a Garden) yet we finde it highly commended to be a *Pulse* requiring little trouble, and to help the Ground the most of any thing that is sown, and to be a good manure for barren Land, where it thrives very well, as on sandy, gravelly, and the worst that may be ; yea amongst *Bulhes* and *Bryars*. Sodden in water it is excellent Food for Oxen ; and doubtless for Swine and other Cattel : if these be true, as probably they seem to be, I admire this Plant should be so much neglected ; but I may give you a more plenary and satisfactory Account of this, and some other not usual Seeds and Pulses another time.

Tares.

These are not usual in most places of *England*, but where they are sown they much benefit the Land as other *Pulses*, and are rather to be preferred for Fodder than any other use they can be put unto.

Other Pulses.

There are several other *Pulses* or *Seeds* mentioned in our Authors, as *Fasels*, *Cich*, *Peason*, *Wilde Tares*, &c. which if carefully and ingeniously prosecuted might redound to the Husbandmans Advantage ; and in the same manner might several other not yet brought into common use, although they might in all probability, be as beneficial as those already in use.

SECT. 4.

Of Hemp and Flax.

Within the compass of our Lands subject to the Culture of the Plough, may these two necessary and profitable Vegetables be propagated, requiring a competent proportion of Ground to raise a quantity sufficient to supply our ordinary occasions and necessities ; in defect whereof, and meerly through our own neglect and sloath, we purchase the greatest share of these *Hempen* and
Flaxen

Flaxen Commodities we use from Strangers at a dear Rate, when we have room enough to raise wherewith of the same Commodities to furnish them : But that (to our shame be it spoken) we prefer good Liquor, or at least the *Corn* that makes it, before any other Grain or Seed, although other may be propagated with greater facility, less hazard, and abundantly more advantageous, both to the Husbandman and Nation in general, than that.

I need not put Excuses into the Countrey-mens mouthes, they have enough for their grand Negligence in this principal part of *Agriculture*, but that I here propose them in hopes some *Worthy Patriots* will use their endeavours to remove these Impediments.

1. The first and most grand Impediment to this Improvement, is want of Encouragement to Trade, or a right Constitution or Ordering of Employments for the Poor throughout the Countreys, which may be accomplished without charge (the common *Remora* to all Ingenuities) by granting some extraordinary *Immunities* to certain Societies in several places convenient in every County to be established; which being the first and chiefest thing to be done, will almost of it self remove all other Impediments.

2. The next is the defect of Experience, very few understanding the way of Sowing, Gathering, Watering, Heckling, and other particular Modes in ordering these Commodities, nor yet thenature of the Ground either of them delights in; All which by the President and Example of some publique and ingenious Spirits, and by the Constitution of a Trade to take off the said Commodities to the Husbandmans Advantage, may easily be removed.

3. Another main Impediment to the Improvement and Propagation of these and several other Staple Commodities, not yet brought into publique use and practice, is, that the Planter after he hath been at extraordinary expence in Fertilizing, Tilling, and Planting his Land, and in preserving and advancing the Growth of such Commodities, not onely the Profit of his Land, but also of all his Expence and Labour must be *decimated*; which in some years amounts to more than his own clear Profits, when before such Improvements made, little Tythe was paid, as for Pasture-Lands is usual; either a reservation to the *Parson* of what was formerly paid out of such unimproved Lands, or a certain *Modus decimandi*, according to the nature of the Commodity planted, might prove a very great Encouragement to the Husbandman, an infinite Advantage to the Nation in general, and not the least injury or loss to the *Clergy*, or Impropiator. Some other Impediments there are, and also other Propositions might be made for the Advancement of this and several other Commodities, but they require more time to treat of, than in this place we may dispense withal.

Hemp delights in the best Land, warm and sandy, or a little gravelly, so it be rich and of a deep soyl; cold Clay, wet and moorish is not good: It is good to destroy Weeds on any Land.

The

The best seed is the brightest that will retain its colour and substance in Rubbing; three Bushels will sow an Acre, the richer the Land, the thicker it must be sown; the poorer, the thinner: from the beginning to the end of *April* is the time of sowing, according as the Spring falls out earlier or later; it must be carefully preserved from Birds, who will destroy many of the Seeds.

The Season of Gathering of it is first about *Lammas*, when a good part of it will be ripe, that is the lighter Summer-hemp that bears no Seed, and is called the *Fimble-Hemp*, and the Stalk grows white, and when it is ripe it is most easily discernable, which is about that season to be pulled forth and dried, and laid up for use; you must be cautious of breaking what you leave, lest you spoil it: you must let the other grow till the Seed be ripe, which will be about *Michaelmas*, or before, and this is usually called the *Karle-Hemp*: When you have gathered and bound it up in bundles, in Bonds of a yard compass (the Statute measure) you must stack it up, or house it till you thrash out the Seed. An Acre of *Hemp* may be worth unwrought from five to eight pound; if wrought up, to ten or twelve pound, or more; and is a very great succour to the poor, the *Hempen Harvest* coming after other Harvests: And then in the bad, wet, and Winter seasons it affords continual employment to such also that are not capable of better.

Value of Hemp

But for the Method and right way of *Watering*, *Pilling*, *Breaking*, *Tewtawing*!, &c. I shall leave you to such that are experienced therein, finding no certain Rules left us by our Rustick Authors.

Flax.

This is also a very excellent Commodity, and the Tilling and Ordering thereof a very good piece of Husbandry, it will thrive in any good sound Land be it in what Countrey soever, but that is best that hath layen long unploughed: the best Land yields the best *Flax*, and raises the greatest Improvement. The Land must be well ploughed, and laid flat and even, and the Seed sown in a warm season, about the middle or end of *March*, or at farthest in the beginning of *April*. If it should come a wet season, it would require weeding.

Best Seed.

The best Seed is that which comes from the *East Countrey*, although it cost dear, yet it will easily repay the Charge, and will last indifferent well two or three Crops, then its best to renew it again: Of the best Seed two Bushels may serve on an Acre, but more of our *English Seed*, because it groweth smaller. You must be sure to sow it on good Land, because it robs the Ground much and burneth it, as anciently it was observed by *Virgil*, *Urit enim lini Campum Seges*, but it liberally repayeth it.

You must be careful that it grow not till it be over-ripe, nor to gather it before it be ripe; the ripeness is best known by the Seed, at the time let the Pluckers be nimble, and tye it up in handfulls, and set them up untill they be perfectly dry, and then house it.

Value of Flax.

An Acre of good *Flax* on the Ground may be worth, if it be of the best Seed, from seven to twelve pound, yea far more; but if it be

be wrought up fit to sell in the Market, it may come to fifteen or twenty pound.

As for the Watering, Drying, Breaking, and Tewtawing, as we said before of *Hemp*, we must refer to those that are better experienced therein.

Sect. 5.

Of Woad, &c.

This is a very rich Commodity, and worthy to be taken notice of by the *Husbandman*, it requires a very rich Land, sound and warm, saith Mr. *Blith*; but I have seen it usually planted upon an ordinary Ground, but warm and light, and in good heart, having long rested, and but new broken up; it robs Land much, being long continued upon it, yet moderately used it prepares Land for Corn, abating the overmuch Fertility thereof, and draws a different Juice for what the Corn requires: the Land must be finely ploughed and harrowed for this Seed, whereof about four Bushels will sow an Acre; it must be very finely harrowed, and all Clots, Stones, Turfs, &c. picked away and laid on heaps, as is usual in *Woad-Lands*, then is to be continually weeded till the Leaves cover the Ground; and when the Leaves are grown fair and large, then set to cutting, and so throughout the Summer, that you may have five or six Crops, and sometimes but three, in one year of *Woad*: what grows in Winter Sheep will eat.

The time for sowing of *Woad*, is in the middle and end of *March*.

When it is cut, it must be immediately carried to the *Mill*. The manner whereof, with the right ordering of *Woad*, and of all other necessary circumstances relating thereto, is best learned of an experienced *Workman*, which is easily obtained.

To take it in the very season is a fundamental Piece, which is ^{To know when it is full ripe.} when the Leaf is come to its full growth, and retains its perfect colour and lively greenness, then speedily cut it, that it fade not, nor wax pale before you have cut your Crop.

The two first Crops are the best, which are usually mixed together in the seasoning; the latter Crops are much worse, which if either are mixed with the former, they marr the whole.

It is a Staple Commodity for the *Dyers Trade*, and is very advantageous to the *Husbandman*, it more than doubleth the Rent of his Land, sometimes it quadruples it; it hath been sold from 6 l. to 30 l. the Tun.

The planting and propagating whereof is esteemed another excellent piece of Husbandry and Improvement for Land, and more especially on *Marsh-Land*, *Fen-Land*, or newly recovered *Sea-Lands*, or any Land rank and fat, whether Arable or Pasture.

The *Cole-Seed* is esteemed the best, the biggest and fairest also that you can get, let it be dry and of a clear colour, like the best *Onion-Seed*; it is usually brought from *Holland*.

It is to be sown at or about *Mid-summer* : you must have your Land ploughed very well, and laid even and fine, and then sow it, about a Gallon will sow an Acre; the Seed must be mixed with some other matter, as before we directed about *clover-grass Seed*, for the more even dispersing thereof.

When the one half of the Seed begins to look brown, its time to reap it, which must be done as you usually do Wheat, and lay it two or three handfulls together till it be dry, and that through dry too, which will be near a fortnight ere it be dry enough, it must not be turned nor touched, if it be possible, lest you shed the Seed: it must be gathered on *Sheets*, or large *sayl-clothes*, and so carried into the *Barn* or *Floor* very large, to be immediately thrashed out.

Profts thereof. The main Benefit is in the Seed: If it be good, it will bear five quarters on an Acre, and is worth usually four shillings the Bushel, sometimes more and sometimes less; the greater your parcel is, the better price you will have. It is used to make *Oyl* thereof; it thrives best on moist Land, it cannot be too rank, it fits the Land for Corn, &c. Thus far hath Mr. *Blish* delivered, little else is written of this Seed, therefore we leave it to the more experienced persons.

Turneps.

Although this be a Plant usually nourisht in Gardens, and be properly a Garden Plant, yet is to the very great Advantage of the *Husbandman* sown in his Fields in several forreign places, and also in some parts of *England*, not onely for *Culinary* uses, as about *London*, and other great Towns and Cities, but also for Food for Cattel, as Cows, Swine, &c. They delight in a warm, mellow, and light Land, rather sandy than otherwise, not coveting a rich Mould. The Ground must be finely ploughed and harrowed, and then the Seed sown, and raked in with a Bush, or such like. They are sown at two Seasons of the year, in the Spring with other the like *Kitchen Tillage*, and also about *Midsummer*, or after, in the Fields for the use of Cattel, or any other use. In *Holland* they slice their Turneps, with their tops, and Rape-seed Cakes, and Grains, &c. and therewith make *Mashes* for the Cows, and give it them warm, which the Cows will eat like *Hogs*.

*Hartlib's Lett.
247.*

Cows and Swine also will eat them raw, if they are introduced into the dyet, by giving the Turneps first boyled unto them, and then onely scalded, and afterwards they will eat them raw.

It is also reported, that at *Rouen* they boyl Turneps with the Leaves on them till they be tender, and add thereto Wheaten-bran, and of the Cakes of Rape-seed or Lin-seed, all which hath a singular faculty of fattening Cattel, (but for Milch-beasts they put less of the Seeds) this they give twice a day, and is the most part of their Feeding for the *Winter* onely.

It is a very great neglect and deficiency in our English Husbandry, that this particular Piece is no more prosecuted, seeing that the Land it requires need not be very rich, and that they may be sown as a second Crop also, especially after *Early-pease*; and that it supplies the great want of Fodder that is usual in the *Winter*,
not

not onely for fattening Beasts, Swine, &c. but also for our *Milch-Kine*.

Sect. 6.

Of Setting of Corn.

Besides the usual manner of sowing of Corn, are there several other wayes of dispersing it, as by setting, and howing of it in, &c. This art of setting Corn seems to be very ancient, as appears by *Virgil*, *Unguibus insodiunt et ipsis fruges*---- and hath been a long time attempted to be brought into practice again, as appears by *Mr. Platts Adams Tool Revived*, printed in the year 1600. where he doth very ingeniously describe, not onely the way, but the great advantage that accrewes by this then new discovery; The first part thereof giving you the reason why Corn sown the common way yields not so great an increase as it doth by being set; then he shews you the manner of digging the Land where you are to set your Corn, (whereof we have spoken before) then he proceeds to the Description of his Instruments, whereof some are onely many pins set at a convenient distance in a board, which compressed on the Earth make so many holes wherein the *Wheat-graines* are to be dropt one by one, but because these are very unnecessary and troublesome, and that there are newer and better wayes found out, I shall decline any further discourse about them; Also he gives you the distance and depth, where he observes that at three inches distance and three inches depth there hath grown thirty Quarters of Wheat on an Acre of Ground, and that four inches in depth and distance hath yielded but twenty Quarters; he also speaks of five inches in depth, and five in distance: Its probable the diversity of the Land or of these years wherein the experiments were proved, might beget some differences. Afterwards he adviseth in barren Lands to fill up the holes with some good mixture or fat Compost, or to imbibe the Grain you set therewith; whereof more hereafter.

Then *Mr. Gabriel Platt* succeeds with his newer and better composed Method of setting Corn, whereby he pretends to remedy all the Inconveniencies of the former way, by his two new invented Engines, the one for the more expeditious setting of the Corn, the other for the laying up the Land on Ridges, just on the top of the rowes of Corn, that neither surplussage of moisture might annoy it, nor frost in Winter kill it, which way prevents the laying the Land in high Ridges before sowing: Neither need the Land be digged, onely ploughed, harrowed and then set.

The description of which *Engine* for the setting of Corn he gives you in these words: "Let there be two boards of equal breadth boarded with wide holes at four inches distance, and be set in a Frame of two foot high, the one from the other, then let there be a Funnel for every hole made of thin boards a-

*Discovery of
infinite Treas-
ure.*

*Description of
Mr. Platts En-
gine for setting
Corn.*

“bout two inches square; Then for the top let there be two thin
“boards of equal breadth boarded likewise, whereof the upper-
“most is to be boarded with an hot Iron, with holes longer the
“one way than the other, and is to be of such a thickness, that
“but one Corn only can lie in the hole; The other board is to be
“boarded with wide holes, and to be loose, that while the En-
“gine is charged the hole ~~part~~ may be under the holes of the up-
“permost board, and when the holes in the Earth are made by
“the Nether workes, then to be moved so that all the Corns may
“drop down.

“And for charging, a little Corn being swept up and down by
“a broom, or a brush, will fill the holes, and if any miss, the
“workman may put in here and there an odd Corn with his fin-
“gers, and then moving the second board till the holes be an-
“swerable, all the Corns will drop down at an instant, then let
“a large ledge be set about the top of the Engine to keep the
“Corn from spilling, and so is the upper part thereof made;
“And as for the Nether work it is somewhat more chargeable
“and intricate, for there must be for every hole, a little socket
“of brass, cast with a Verge to nail unto the Nether board about
“the hole, which must be ~~turned~~, and boarded all of one wideness
“to an haire breadth, and must be wide above, and streight be-
“low like a Faucet; Then there must be Iron pins of five inches
“long, of great thick Iron wyer, drawn so fit, that no earth can
“come into the brass sockets; Now to make these play up and
“down at pleasure, is the greatest skill in the whole work, and
“there is no other way, but that which is here described; There
“must be for every wooden Funnel a piece of Iron forged flat,
“with a hole in the middle, edge-wise; which through two slits in
“the nether part, must play up and down, through which a brass
“nail must be fastned, cast with an head, contrary to other nails,
“bowing downwards, to which the Iron pins must be fastned
“with wyers, and so thrust down and plucked up at pleasure;
“And then every end of the flat pieces of Iron must be fastned
“into a piece of wood, of such thickness, that two thereof may
“fill up the distance between the rows of the Wooden Funnels.
“These may be made to play up and down like Virginal Jacks,
“and when they are lifted up, then the brass Funnels being wi-
“der above than below, giveth leave for the Corn to fall into
“the holes all at an instant. These Jacks must be fastned toge-
“ther, the two first on either side of the wooden Funnels, then
“so many together as the weight of the workmen is able to thrust
“down to make the holes; And there must be a stay to hold up
“the Jacks at pleasure when they are lifted up again to such
“an altitude, as that the Corns may descend by them into the
“holes; And the bottom of the Iron pins must be flat, and by
“that means they will not be so apt to draw up the Earth into the
“Funnels, also the roots of the Corn will spread better, and
“bring a greater increase, if the ground be saddned a little in the
“bottom of every hole; And the tops of the Iron pins must like-
wise,

“wife be flat, and hang a little loose in the wyers, else if any of
 “the brass sockets get a little wrench, they will not be drawn
 “through, because the holes must be streight; Though the
 “makeing of this Engine be somewhat chargeable and trouble-
 “some, yet if skilful men first break the Ice, then it will be com-
 “mon and the most profitable invention that ever was found out,
 “and the top of the Engine must be ledged about with large
 “ledges, to keep the Corn from spilling; so will a quart or two
 “of Corn serve a good while and must be renewed upon occa-
 “sion; Also if the slits in the Funnels be lined with Iron, the
 “work will be more dureable.

“But lest the charge of this Engine, together with the diffi-
 “culty of getting it, may be a hinderance to the work intended,
 “our Author adds a description of a more easy way (as he suppos-
 “eth) for the poorer sort, which is subject to the capacity of e-
 “very ordinary workman, and is made of wood onely without
 “either brass or iron; But he further tells you these Engines
 “will not endure like the other, besides there must be four
 “workmen, because the Engine must be made of two parts, the
 “one to go before and make the holes, and the other to come af-
 “ter and drop in the Corn: This last must not differ a whit from
 “the upper part of the former, onely it must have four feet like
 “tops, in the four corners which must be set right in the holes,
 “which are made by the other part, which goeth before, which
 “likewise must have four such feet to leave an impressiion, when
 “it is removed forward, whereby the second may be rightly
 “placed, so that the Cornes may fall right into every hole;
 “That part which must make the holes is to be made of two
 “boards of equal breadth to the other, and must be boarded full of
 “holes, of equal distance likewise, the wooden pins must be
 “greater than those of Iron, because the holes will need to be
 “somewhat large and wide, and they must be fast in the upper
 “board, and loose in the nether board.

“And if the Engine be large as this way it may be larger than
 “the other, by reason that it is easlyer lifted and removed, be-
 “ing in two parts, then the upper part must be slit, and divided
 “into so many parts, that the weight of the workmen by tread-
 “ing upon them, may press them down to make the holes, and
 “though this way will require four workmen, yet the charge
 “will not be double, nor much more than the former way, by
 “reason that the workmen may go forward with more expedi-
 “tion, and may set a broader compass of ground at one
 “time.

Thus far hath Mr. *Gabriel Platt* proceeded in his description of his
 Instruments, which are the most accurate & ingenious that we find
 publish'd, I have given it you *verbatim*, lest any mistake might be im-
 puted to the *relator*; To ingenious men it is plain enough, but to
 others this and every thing else besides the plain *Dunstable road* is
 intricate, *Capiat qui capere potest*. Let such make use of it that
 are willing to promote *Ingeniuty*, its probable it may succeed,

The second
Engine.

The reason
whereof is I
suppose that the
lower board
should be kept
down whilest
the pins be
drawn out of
the earth that
the earth fall
not into the
holes.

according to his design, and your expectation; if not, by the Errors of these and such like, you may discover some better and more facile way to accomplish this Enterprize, *Facile est addere Inventis*. Let not a few Errors or mistakes, or bad successs, discourage any man in a design of so great and publick concernment, and experimented at so easy an expence.

Errors in these
Engines,

But lest any should be over-confident in these Engines, and spend much time and some cost on their preparation, and not immediately find them to respond to his expectation, which might beget a Prejudice not onely against this but all other wayes esteemed Novel, for such that are over earnest to accomplish any design, in case it succeed not, are sooner prejudiced against it than those that undertake it with more Caution, I shall therefore discover such Inconveniencies and Errors that you may probably meet withal in this way *Mr. Platt* describes.

1. Men, not Children, nor Women are capable of this Employment, that it will be very difficult to procure setters for any great quantity, the work being so tedious and so many required to perform it; Such Inventions being to be preferred, that are most universal and performed in less time and with less expence.

2. In hard, stiff, clay ground, or any other after rain, holes will be very troublesome to make, the pins going down right and rising perpendicularly again will bring up much of the Earth with them, that it will be an intollerable trouble to keep them clean.

3. In stony Land, or where roots of trees, &c. annoy the ground this Engine will be useles, for if one straw hinder one pin, the rest cannot enter.

4. The pins must be very thick and neer together, else if any of the Corn be injured by worms, frost, &c. your Crop will be defective.

Howing in of
Corn commen-
ded.

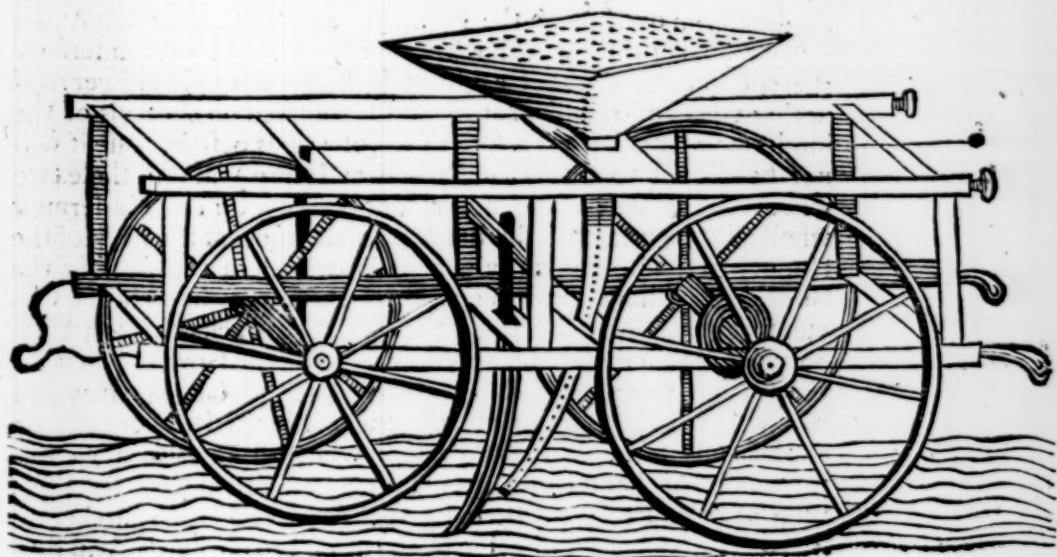
Hartlibb's Le-
gacy.

All which Inconveniencies and Errors, are remedied and prevented by howing in of Corn by hand in rowes, both for the saving of Corn and conveniency of weeding, and for the better encrease at the harvest, far beyond what can be expected the common way; Also it is of much less expence than the setting Engine.


These several ways are all that we find as yet discovered, and these also for what I can understand but little practised, at least for Corn, but for Pease it is usuall, especially the better sort of pease, to be howed in as. *Mr. Hartlibb* prescribes, and that to a very considerable advantage: also I have caused the best sort of pease to be set as beans in double rows at a good distance with admirable successs.

But to remedy and remove all maner of Errors or Inconveniencies that can be found in setting or howing in of Corn, I shall here give you a plain and perfect description of an easie and feazible Instrument that shall disperse your Corn Grain, or Pulse, of what kind soever, at what distance and in what proportion you please to design, and that with very great expedition, and very little extraordinary charge, expence, or hazard.

First,



First make a Frame of small square pieces of timber of about two or three inches square, the breadth of the Frame about two foot, the height about eighteen inches, the length about four foot, more or less as you please; place this Frame on two pair of ordinary Pough-wheels. The Axeltree of the two foremost wheels is to lock to either side as doth the fore Axeltree of a Waggon, for reasons hereafter shewn, the hindermost Axeltre being of Iron and square in the middle, must be fixed to the Center of the wheels, that the Axes and wheels may move together; Then about the middle of the Frame in the bottom let there be fixed an Iron Instrument, or of Wood, pointed with Iron, like unto a Coulter, made a little spreading at the bottom in the nature of a share, made to pass through two Mortoisies on the top for its greater strength, and made also to be wedged higher or lower according as you will have your furrow in depth; the use whereof is onely to make the furrow so that you must make the point thereof of breadth onely to move the Earth, and cast it or force it on either side, that the *Corn* may fall to the bottom of the furrow, then over this *Share* or *Coulter*, a little behinde it may a Wooden-pipe be made to come from the top of the Frame to the lower end of the *Share*, tapering downwards, and as neer as you can to the *Share* to deliver the *Corn* immediately as the ground is opened, and before any Earth falls in, that what Earth doth afterwards fall in, it may fall on the *Corn*. This pipe is to proceed out of a large Hopper fixed on the top of the Frame that may contain about a bushel more or less, as you think fit, but that the *Corn* may gradually descend, according to the quantity you intend to bestow on an Acre, at the very neck of the Hopper underneath in the square hollows thereof, must be fitted in the edge of a wheel of wood, about half an inch thick and proportionable to the cavity of the neck, the wheel need not
be



be above two or three inches Diameter, and fixed on an Axis extending from one side of the Frame to the other, on which Axis is also to be another wheel with an edge on the Circumference thereof like the wheel of a Spit or Jack, which must answer to another wheel of the like nature and form fixed on the Axis of the hindermost wheels, then fit a Line (of silk is best because it will not be so apt to shrink and reach as Hemp) about these two wheels, that when the Instrument moves on the hindermost wheels by the means of the line, the small wheel at the neck of the Hopper may also move, which lesser wheel in the neck of the Hopper may have short pieces of thick leather fixed in the Circumference thereof like unto the teeth of a Jack wheel that upon its motion it may deduce the Corn out of the Hopper, in what proportion you please; for in case it comes too fast then may you by a wedge at the *Tenon* of the piece whereon the Hopper rests, or at the end of the Axis of the lesser wheel, like as in a *Querne*, force the wheel and Hopper together, and in case it feeds too slow, then may you remove them by the same wedges to a further distance: also in case your line be too slack or too hard, you may prevent either extream by a wedge in the place where the Axis of the wheels moves, or by a third wheel about the middle of the line made to move further or neerer as you see cause.

The more particular use and benefit of this Instrument.

1. As to time.

One horse and one man may work with this Instrument, and sow Land as fast or faster than six horses can Plough, so that you may with ease compute the expence, in case your Instrument be single, but you may in the same Frame have two shares at twelve inches distance more or less, as you will have the rows of Corn distance the one from the other, and two pipes out of the same hopper, and two small wheels on the same Axis, with other wheels answerable, every whit as easie to be performed as one, and then may you double your proportion of Land in a day.

2. Equality of Seed.

This Instrument will always keep the same proportion you first set him to, which you must thus contrive: first know the length of the Furrow you sow, then cast up how many of these Furrows at such distance your Instrument is made for (whether a foot more or less) will amount unto an Acre, then conclude how much to sow on an Acre; as suppose a bushel, then divide that bushel into so many parts as you have furrows or distances in that Acre, then take one or two of those parts, and put into your Hopper, and observe whether it will hold out or super-abound at the end of one or two Furrows, and accordingly proceed and rectifie the Feeder; or you may judge by your own reason, whether it feed too fast, or too slow.

3. Rectification of the Feeder.

In case it feeds too fast, notwithstanding they be close placed together, then may you make that Wheel at the lower Axis wherein the Line moves, to be less than the upper, then will the motion be slower: And thus may you make it move as slow as you will by augmenting the upper, and diminishing the lower Wheels, wherein the Line is, and make it move faster by the contrary Rule.

In case you drive apace, it feeds apace; in case you drive but slowly, it feeds but slowly: here is no error.

When you come to any turning at the Lands-end, by lifting up the hindermost part of the Instrument, that those Wheels touch not the ground, the feeding of the Corn immediately ceaseth until you set it down again.

Also all the Corn you sow lyes at one certain depth, none too deep, nor any too shallow.

You may place a small kinde of Harrow to follow, but the best way is to have on each side each Furrow, a piece of wood a little broad at the end, set aslope to force the Earth rounding on the Corn; this may well be placed and fitted to the bottom of this Instrument just behinde the Share, and Feeding-pipe.

By this Method of Sowing, any sort of Grain or Pulse may be saved the one half, and in some places more, which by the other way is either buried so deep under Clots, that it cannot come up, or else is so shallow that the Cold in the Winter, or Drought in the Summer killeth it, or else lyes on the Surface as a prey to the Fowls of the Air: Much also thereof falls in clusters, twenty or thirty Grains where one or two might suffice, which are common Inconveniences, and usually happening to the vulgar way of sowing Corn, the greater half by far is lost, which in all probability may be saved by the use of this very Instrument, which will doubly requite the extraordinary charge and trouble thereof; for here is no Corn sowed under Clots but in Rows, as the Earth is stirred and moved, it is all at one certain depth, and at one certain distance, and equally covered, below the injury of Frost, and Heat, and Rapine of Birds. Also by this way the Corn may be sown in the very middle or convenient depth of the mould, that it may have the strength of the Land both below and above the Root, which in the other more usual way the Corn falls to the bottom of the Furrow on the Gravel, Clay, or such like hard Ground, that it seldom thrives so well as what happen to be in the midst. This way also exceeds the way of setting Corn, where the Pins thrust into the ground hardens, and fastens the mould, that unless the Land be very light, it confines the Roots to too narrow a place, which in this way is prevented, as I have lately observed in Garden-beans, that those hewed in, prove better than those set with a stick.

By the use of this Instrument also may you cover your Grain, or Pulse with any rich Compost you shall prepare for that purpose, either with Pigeon-dung dry or granulated, or any other Saline or Lixirial Substance, made disperseable, which may drop after the Corn, and prove an excellent Improvement; for we finde experimentally that Pigeons-dung sown by the hand on Wheat or Barley mightily advantageth it, the common way of Husbandry; much more then might we expect this way, where the dung or such like substance is all in the same Furrow with the Corn, where the other vulgar way a great part thereof comes not near it.

4. No difference in driving just or slow.
5. No loss of Seed.

6. Needs no harrowing.

General Advantages of this Instrument

It may either be done by having another Hopper on the same Frame behind that for the Corn, wherein the Compost may be put and made to drop successively after the Corn; or it may be sown by another Instrument to follow the former, which is the better way, and may both disperse the soyl, and cover both Soyl and Seed.

The Corn also thus sown in Ranges you may with much more conveniency go between, and either weed it or hoe it, and earth it up as you think good, and at Harvest will easily repay the Charges.

Also the Fore-wheels being made to lock to and fro on either side, you may have an upright Iron-pin fixed to the middle of the *Axis* extended to the top of the Frame; and from thence a small Rod of Iron to come to your hand, with a crooked neck just against the neck of the Hopper; by means of which Iron-rod you may lock or turn the Wheels either way, and guide your Instrument, and rectifie it, if it deviate out of its right course.

The Hopper must be broad and shallow, that the Seed press not much harder when it is full, than when it is near empty, lest it sow not proportionably.

This Instrument, although it may at the first seem mysterious, and intricate to the ignorant, yet I am very confident it will answer to every particular of what I have written of it; and any ingenious Wheel-wright, Joyner, or Carpenter may easily make the same with very little instruction, and any ordinary Plough-man may use it.

Another excellent Advantage of this Instrument.

If your Land be either near the Water, or Clay, or Sand, Rock, Gravel, &c. it is not then convenient to sow the Corn within the Land, because it may not have depth for rooting: By this Instrument may you then by placing the *Shure* near the top of the Land, onely to remove as it were the Clots, &c. drop your Seed in rows, and by certain *Plins* or pieces of Wood, or Iron, made flat at the end, and a little sloping set on each side such Rows of Corn or Grain, the Earth may be cast over it and laid in Ridges, above the ordinary level of the Land, which way I have proved to be very advantageous to Beans laid on a shallow Ground, and covered over, &c.

SECT. 7.

Of the general Uses of Corn, Grain, Pulse, and other Seeds propagated by the Plough.

Use of wheat.

This is the most general Grain used here in England for Bread, although it be not unfit for most of the uses the other Grains are fit for; As for Beer, the best Beer to keep hath usually a proportion of Wheat added to the Mault, and the Bran also of Wheat a little thereof boyled in our ordinary Beer, maketh it mantle or flower in the Cup when it is poured out, which sheweth with what a rich spirit Wheat is endowed withal, that so much remains in the very Bran. Also Starch is made of musty and unwholesom

wholeſom Wheat, and of the Bran thereof, than which there are few things whiter.

Its principal Uſe is for the making of Beer, being the ſweeteſt *Of Barley.* and moſt pleaſant Grain for that purpoſe; its alſo one of the beſt Grains for fattening of Swine, eſpecially being either boyled till it be ready to break, with no more water than it drinks up; or ground in a Mill, and wet into Paſte, or made into a Meſh, either way it produces moſt excellent ſweet Bacon.

Its general Uſe is for Bread, either of it ſelf or mixed with *Of Rye.* Wheat; it makes the Bread moiſt, and gives it a very pleaſing taſte to moſt Appetites: I know no other particular uſe thereof, (it being not univerſally propagated) onely its reported that it yields great ſtore of *Spirit*, or *Aqua Vita*.

This is the onely Grain for a Horſe, and beſt agrees with that *Of Oats.* Beaſt of any other, and in which the Horſe moſt delighteth; and is a conſtant food either for *Bread, Cakes, or Oatmeal*, to the *Scots*, and ſeveral *Northern places* in *England*, and in ſome part of *Wales*. Oats alſo will make indifferent good *Mault*, and a little thereof in Strong Beer to be kept, is uſual. They are a Grain that Poultreys alſo love to feed on, and it makes them lay ſtore of Eggs above what other Grain doth.

The common Uſe of Pulſes are generally known, as well for *Of Pulſes.* Men as Beaſts; but there are ſeveral that pretend to extract from them excellent Liquors, and diſtil very good *Spirits* or *Aqua Vita*, without mauling, as one (in a certain *Tract* published by Mr. *Hartlib*.) pretends that Rye, Oats, Peaſe, and the like inferior ſort of Grains, handled as *Barley* until it ſprout, needing not for this work to be dried, but beaten and moiſtened with its own Liquor, and ſoundly fermented, will yield a monſtrous increaſe. He alſo affirms, that out of one Buſhel of good Peaſe will come of *Spirit* at the leaſt two Gallons or more, which will be as ſtrong as the ſtrongeſt Annifeed Water uſually ſold in *London*: this he affirms to be of the leaſt. He afterwards in the ſame *Tract*, gives the particular proceſs, which is thus:

Let Peaſe be taken and ſteeped in as much Water as will cover them, till they ſwell and Corn, and be ſo ordered as *Barley* is for Maulting, onely with this difference, that for this work if they ſprout twice as much as *Barley* doth in Maulting, 'tis the better. The Peaſe thus ſprouted, if beaten ſmall, which is eaſily done they being ſo tender, put into a Veſſel and ſtopt with a Bung and Rag, as uſually, theſe will ferment, and after two, or three, or four moneths, if diſtilled, will really perform what before is promiſed.

Thus (he alſo addes) may a *Spirit* or *Aqua Vita* be made out of any green growing thing, Roots, Berries, Seeds, &c. which are not oyl.

Alſo that the *Spirit* which is made out of Grain not dried into *Mault*, is more pleaſant than the other.

It is not unlikely that Grain may afford its *tincture*, and that excellent Beer or Ale may be made thereof without Maulting:

but these things require in another place to be treated of; And also of the different ways of *Fermenting Liquors*, which we refer to another time and place.

The uses of
Hemp-seed,
Flax-seed,
Rape and
Cole-seed.

Hemp-seed is much commended for the Feeding of Poultry and other Fowl, so that where plenty thereof may be had, and a good return for Fowl, the use thereof must needs be advantageous, ordered as you shall finde hereafter when we treat of Poultry.

Flax-seed or Lin-seed, Rape and Cole-seed, are generally made use of for the making of Oyl.

Of the Preservation of Corn.

The Preservation of Corn when it is plenty and good, is of very great advantage to the Husbandman, and the Kingdom in general; for in scarce and dear years the Husbandman hath little to sell to advance his Stock, and the Buyers are usually furnished with musty and bad Corn, from foreign parts, or from such that were ignorant of the ways to preserve it.

Therefore in cheap years it will be very necessary to make use of some of these ways for the storing up your Plenty of Corn, against a time of Scarcity.

On Reeck-stalls.

The way of making of it up in *Reecks*, on *Reeck-stalls*, set on stones that the Mice may not come at it, is usual and common.

Corn laid up
with the Chaff

But Corn thrashed and clean winnowed is apt to be musty, therefore some advise, that you lay up your Corn in the Chaff in large Granaries made for that purpose secure from the Mice, and when you use or sell it, then to winnow it.

Corn laid up
with Beans.

Also it is advised to mix Beans with Corn, and that it will preserve it from heating and mustiness. Its probable that if the Beans be well dried on a Kiln it may succeed, for then will they attract all superfluous moisture unto them, which is the onely cause of the injury to the Corn: For in *Egypt* when it is so dry, Corn will keep in open Granaries many years, as in *Pharaohs* time. The Beans are easily separated afterwards from the Corn.

Iron, stones, &c.
mixed with
Corn.

It is also reported, that pieces of Iron, Flints, Peebles, &c. mixed with Corn preserves it from heating, which may be true, for it is usual to set a stick an end in Corn, onely to give passage for the Air to prevent heating. A large Granary also full of square wooden pipes, full of small holes, may keep long from heating, though not so well as the *Chaff*, *Beans*, &c.

A double Granary,
one over
the other.

Also some have had two Granaries, the one over the other, and filled the upper, which had a small hole in the bottom, that the Corn by degrees, like Sand in an Hour-glass, hath fallen into the lower, and when it was all in the lower, they removed it into the upper, and so kept it in continual motion, which is a good way also to preserve it.

Sect. 8.

Of the Preparation of the Seed.

The greatest part of Vegetables, and more especially those whereof we have before treated, are propagated of Seed which included in a very small shell, skin, or husk, containeth the very Quintessence of the Plant that produced it, and is as it were the Life and Spirit of the Vegetable, coagulated into a small compass.

Etenim [Natura] et tota Plantæ mole nobiliores & maxime activas particulas segregat, easque cum pauxillo terræ & aquæ simul collectas, in Semina velut Plantæ cujusvis quintas essentias efformat; interim truncus, folia, caules, & reliqua Plantæ membra, principis activis, pene orbata, valde depauperantur, ac minoris efficacie ac virtutis existunt. This Seed or Spirit of the Plant being cast into its proper Matrix or Menstruum, in its proper time, doth attract unto its self its proper nourishment or moisture, which by its own strength or power it doth ferment, and transmute that which was before another thing, now into its own being, substance, or nature, and thereby doth disband its self, and encrease into the form and matter by Nature designed. A more *Phylosophick* Definition and Dissection of the nature of the Seed and Vegetation, we will leave to the more Learned, and content our selves in our *Rural Habitation* with so much of the understanding thereof, as shall guide us unto the Discovery and Application of what may be this proper Menstruum wherein each Seed most rejoiceth in, and with most delight attracteth; for it is most evident, that every Seed as it differs in nature from another, so it requires a different nourishment. For we perceive that in the same Land one sort of Seed will thrive where another will not, according to the Proverb, *One's Meat is another's Poison*; And that any sort of Grain or Seed will in time extract, and diminish such Nutriment that it most delights in. Which is the cause that our Husbandmen do finde so great an Advantage and Improvement by changing their Seed, especially from that Land which is often tilled, which they call *Hook-Land*, into Land newly broken; and from dry, barren, and hungry Land, to rich and fat Land; also from Land inclining to the *South*, to Land inclining to the *North*, & *e contra*; all which produce a good Improvement. As Cattel that are taken out of short, sowre, and bad Pasture, and put into good sweet Pasture, thrive better than such that are not so exchanged. After the same manner it is with Trees removed out of bad Ground into good; all which are manifest Signs that there is some particular thing wherein each Seed delights: which if we did but understand, we might properly apply it, and gain Riches and Honor to our selves, but because we are ignorant thereof, and are content so to remain, we will make use of such Soyls, Dungs, Composts, and other Preparations and Ways of Advancement of the Growth of Vegetables, as are already discovered and made use of, and shall here give unto the Reader the several Ways and Methods we finde dispersed in our

Dr. Willis, de
Fermentatione.

Change of Seed
an Improve-
ment.

Steeping of
Corn in Dung
water.

Rustick Authors for the imbibition of the Seed, which hath been long attempted, and many ways tryed; but most of them have fallen short of the expectation of the Experimenters, because they neither took the right Matter, nor observed the right manner of the Operation. As according to some Authors you are prescribed to steep your Corn in Dung-water, or Water wherein Cow-dung hath lain some time, which its probable may be some, though little advantage to the Corn.

Then in one of the same Authors are ye commended to an Experiment better than the former, That whereas before you steeped your Corn in the Water, which had sucked out the strength and salt of the Dung, you must now mingle your Dung, your Water, and your Corn together, & stir them one whole hour at the least; also in the evening stir them again for half an hour or more, let them stand together all night, and the next day at some tap draw away the Water, then mingle the Corn and Dung thoroughly well together, and after sow the Dung and Corn so mixed in a barren and hungry mould, and you shall have (saith mine Author) as rich a Crop, as if the Ground it self had been dunged before; he giveth also a *Probatum est* unto it.

Adams Tool
Revived.

The same Sir Hugh Platt gives you a process of steeping Corn out of *Johannes Baptista Porta*, which he pretends to cause a wonderful encrease, and at least five for one above the accustomed yield, which is, *To take the Corn out of the middle of the Ear, and bathe it in sweet Ointment made with the fat of old Goats, being mixed with Bacchus and Vulcan*, [which our Author interprets to be Goats-dung, the older the better, moistened with Wine, or New Must, or I rather judge Lees of Wine] *let their soft and even laid bed be gently warmed*, [which he also interprets to be the Digging of the Land; and by warming, its probable he means soyling or watering it with some prepared rich Liquor.]

Also our Author there advises for the steeping of Corn in New Ale, or Wort, its own natural Bathe; but seems to prefer the steeping thereof in the Water wherein the Dung of Oxen, Kine, and Sheep, and Pigeons-dung hath been imbibed, which he prescribes to be about two parts of Water to one of Dung, and let them stand four or five days, often stirring them together; which water decanted or courly filtred is fit for your use, wherein you are to steep your Corn till it be glutted therewith, which you may easily discover, but be sure not to overcharge the Corn with this Liquor.

Thus far we finde how the steeping of Corn in Dung-water hath been used, and approved of, and that as may be presumed, from the rationality of the thing, and credit of the Author, with some good success; But it is probable it might not always answer the expectation of the Experimenters, or at least not to produce so great an Increase as the Authors promise; neither can those ways be so excellent as these we shall advise you to, being grounded on more rational Principles, and have been proved to be more effectual than the other.

That which containeth in it most of the *Universal Subject*, or
Matter

Matter of Vegetables, (whereof we discoursed at the beginning of this Treatise) is the fittest for this purpose; of all which, Nitre or Sal terræ is esteemed the best, wherewith Virgil adviseth to infuse or besprinkle the Seed:

Semina vidi equidem multos medicare serentes

Et intro prius --- profundero ---

This also is that Subject Glauber so highly extols, where he says, *Si Agricola semen hoc menstruo humectatum in agrum spargunt, citius* Miraculum Mundi. p. 50. *maturascit, granis pinguioribus, &c.* If Husbandmen did sow their Seed imbibed with this Menstruum, it would sooner beripe, and bear better Grain, &c. This Subject or Menstruum he labors in several Tracts of his, to prefer above any other matter whatsoever; for all sorts of Vegetables, either by application thereof unto the roots, or by way of irrigation, or by imbibition of the Seed therein, as very highly conducing to Fertility, and acceleration of Maturation; but in another Tract of his, being the Explication of the former, he very honestly undeceives all such that judge this Nitre or Subject, to be common Nitre or Salt-petre. *Velim autem mentem intelligi meam* Explicatio Miraculi Mundi. 51. *non accipiendum esse nitrum commune, hisce minime proficuum,* Common Nitre being not fit for that purpose. The Nitre or Sal terræ intended by these and other Learned Authors, as apt for this work, is the fixed Salt extracted out of any Vegetable, Animal, or Mineral, thoroughly calcined, as after the burning of Land in the common way of burn-baiting, that which causeth so great Fertility is as well the fixed Salt or Alkali that's left in the Ashes, as the waste or expence of the sterile acid Spirit which before kept that vegetating Salt from acting. What is it that is fertile in Lime, Ashes, Soap-ashes, &c, but this Nitre or Sal terræ, this Universal Subject lefetherein, and most easily separable after calcination.

There let every Husbandman that expects so large a Product or Reward, take the right matter, such that Glauber cast on his Asparagus, which through its fiery nature destroyed the Worms, or banished them wholly from their ancient habitations, and by its vegetating and fructifying nature it made the Asparagus thrive more fully and perfectly than before, &c. Idem 46. This Salt is as easie to be procured, as the Lee or Lixirium wherewith the women usually scower their Clothes, being extracted out of any Ashes, either of Vegetables, Animals, or Minerals. All the difficulty is in the true proportion and strength of this Lixirium or Menstruum; for Glauber advises in another Tract of his, by no means to add too much thereof to the Vines, lest they grow too rank: but in our way of Imbibition of Grain, we need not fear that, onely we must be cautious of, that the great and fiery heat thereof destroyeth not the Corn, for the highest Medicines taken in excess, prove the greatest poisons: but let not this prove a Discouragement, for it cannot be difficult to prevent this Inconvenience, either by moderating the quality of the Menstruum, or the time of imbibition.

Next in place to this Universal Subject may be used such materials that contain most of the same, as the Dung of Sheep, Pigeons, and other Fowl, who because they make no Urine, have their Dung enriched

enriched with a greater quantity of that *Subject* than other Creatures, whence it is usually extracted by the *Urine*: *Sheep* also drink but little, and feed dry, which makes their Dung exceeding rich and fertile. I casually met with the following *Process* highly applauded by the Owners thereof, promising wonderful Productions from it, which is thus:

Take half a Bushel of Sheeps-dung, and put upon it twenty quarts of Spring-water, set it on the fire till it be luke-warm, but not boyling, and so rub with your hand all the Sheeps-dung by little and little (till it be dissolved in the water) then let it stand twelve hours, after which strain the water through a coarse Cloath, with a hard Compression, this Water keep for use; Then take of Bay-salt and dissolve it in luke-warm water, which water filter and evaporate in an Earthen Vessel over the Fire; of this congealed Salt after the waters Evaporation, take two good handfuls, likewise do the same with Salt-petre, dissolve it in water, filter the water, and evaporate it, then take of the remaining congealed Salt-petre one good handful, and let both those Salts dissolve in the fore-mentioned Liquor of Sheeps-dung, making it again milk-warm; when all the Salts are therein well dissolved, put into that prepared Liquor eight Gallons of Corn, or other Seed, and let it steep therein thirty, or thirty six hours, then take it and put it into a Sieve, and drain the water into another Vessel, which water may be used again in like manner; when the water is all drained away, take the Corn or other Seed and dry it in some Upper-loft exposed to the Air, not to the Sun, and being almost dry, scatter or sow it in half proportion, *N. B.* that the Sheeps-dung dregs being dried must be calcined, and the Salt thereof drawn in luke-warm water, which being filtered and evaporated, the remaining Salt thereof is to be dissolved with the other Salts in the Sheeps-dung water.

I have here given you this *Process gratis*, which hath been valued and contracted for at a high rate, the Owners promising a very great Increase to succeed. The *Process* appears to be made not by such that are experienced in Rural Affairs, for you will finde it difficult to strain your Sheeps-dung water, dissolved in those proportions; for the Sheeps-dung wholly dissolves, which doth so thicken the water, and convert it into a mucilage, that all goes where the water goes, if rightly done; and that which is more strange, the Grain will not onely imbibe the water so *animated*, but the very substance of the Dung also, if rightly ordered; which is an Argument sufficient of the melioration of the Grain, insomuch that no dregs or remainder of the Sheeps-dung was lost, save onely a few undissolved treddles. As for the Salts, I think little good is to be expected from them, and therefore hold those troublesome preparations of them needless; onely the Salt of the Dung must needs be good, because it is that *vegetative Salt*, or *universal Subject*, whereof we discoursed before, onely it is far fetched and dear bought, as good may be had at a far easier rate, for this purpose.

Nevertheless common *Sea-salt* hath been much cryed up by some for an Improver of the Seed, and an Example produced of a silly Swain,

Swain, who passing over an Arm of the Sea with his Seed-corn in a Sack, which by mischance at his landing fell into the water, and so his Corn being left there till the next low water, became somewhat brackish, yet (out of necessity) did the man bestow the same Wheat upon his ploughed Grounds, and at the Harvest he reaped a Crop of good Wheat, such as in that year not any of his Neighbors had the like. *Jewel-house
of Art and
Nature.*

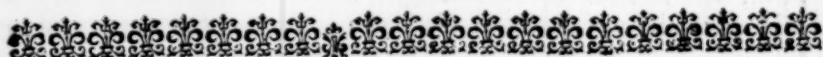
Doubtless infusion of the Corn or Seed in any of the aforesaid materials, is some advantage to it; or in the Lees of Wine, Ale, Beer, Perry, Cider, or else in Beef-broth and the Brine of Poudering-tubs, as is by some advised.

Also some affirm that Corn spritted a little, as they use to do for Mault, and then sown, came up speedily, and got the predomination of the Weeds at first, and so kept the same, that there was produced a far greater increase than ordinary; which is a sufficient convincing Argument, that if common water produce so manifest an Improvement, that then a better Liquor may much more.

Because the Corn also will seem troublesom to sow being wet, it is prescribed either to let it dry a day or two on a Floor, or else to sift slackened Lime thereon, which is to be preferred because it preserves the Corn from Vermine, smutt, &c.

I finde also another compounded Liquor to have been commended and experimented for the steeping of Grain therein, which is *Hartlib's Letter* thus: Pour into quick and unslaked Lime, as much Water as sufficeth to make it swim four inches above the Water, and unto ten pound of the said Water poured off, mix one pound of *Aqua Vite*, and in that Liquor steep or soak Wheat or Corn twenty four hours, which being dried in the Sun, or in the Air, steep again in the said Liquor twenty four hours more; and do it likewise the third time, afterward sow them at great distances the one from the other, about the distance of a foot between each Grain, so one Grain will produce thirty, thirty six, thirty eight, forty two, fifty two Ears, and those very fruitful, with a tall Stalk equalling the stature of a man in height.

This seems to be a most rational Process for this purpose, and on this and the like wayes of maceration or fermentation of the Seed depends those several Experiments, where the Corn or Seed hath yielded so prodigious an Increase, as that one grain of Wheat should yield a hundred and fourteen Ears, and in them six thousand Grains, but in case it generally hold to be but a quarter of the number, it is beyond what any other way of Husbandry can perform.



CHAP. V.

Of the Manuring, Dunging, and Soyling of Lands.

HAVING discoursed of *Meadows*, *Pastures*, and *Arable Lands*, and of the great Advantages and Benefits that are raised out of them, and of the several ways of Improving *Meadows* by drowning or watering, and of *Pastures* and *Arable Lands* by Inclosure, by sowing and propagating New Hayes, Grasses, and the best sorts of Corn, Pulse, and other Seeds, and by the best way of Tilling and Ordering the same; Now it will be necessary to say a little concerning this most general way of Improvement by *Manuring*, *Dunging*, and *Soyling* of *Land*, under which terms we comprehend all the several ways of tempering, altering, renewing, or adding unto the Land, or applying any subject whatsoever thereunto for its Improvement and Advantage.

SECT. I.

Of the Burning of Land.

The Burning of Land or any other operation on it by Fire, seems to be the greatest, though not most universal advance to most of our barren poor and hungry Lands, as well dry as wet: the Burning of the ground it self seems to be of very Ancient use as appears by *Virgil*.

Sepe etiam steriles incendere profuit agros.

Gages Survey
of the West-Indies.
Silva.

And of burning of Wood, and other Combustible Materials on Land, is practised amongst the *Americans* for the Improvement of their Land; which is an Argumente as well of their Natural Ingenuity, as of the excellency, and advantage of the Improvement. For the Burning of such Combustible things on Land, doth very much heat the ground & wastes that Acid sterile juice that hinders fertility and sets free that fertile principle the *Sal Terre* which before was for the most part bound up; also it leaves a good quantity of that Salt on the Land mixed with the ashes which is generally held to be the onely advantage this way yeilds, though the contrary appears; for wheresoever the Fire is made although you remove the ashes wholly yet will the place bear a better Crop than where you bestow the ashes, as formerly we noted.

On what lands
burn-baiting
good.

This art of Burning of Land, usually called *Denshiring* (*quasi* *Devonshiring* or *Denbighshiring* because it seems there to be most used or to have been invented) or burning the Bait, is not applicable or necessary to all sorts of Land, for in a good, fertile, rich, loose

loose Soyl, where a good sweet Grass, or good Corn flourisheth, it wastes as well the good as the bad juice, wherefore in most places in *Somersetshire* and such other fertile places they reject it.

But for barren, sower, heathy, and rushey Land, be it either hot, or cold, wet or dry, it is a very great Improvement, insomuch that most sorts of such poor Lands will yeild in two or three years after such Burning more above all charges, than the Inheritance was worth before.

The most usual Method is, with a Breast-plough to pare off the Turf, turning it over as its cut that it may dry the better; if it prove ^{Manner of burn-baiting.} a very dry season and the weather hot, then it needs no more turning, but if the weather be casual, it must be turned, and the Turfes set a little hollow, that they may dry the better, and when they are through dry, they may be layd on small heaps about two Wheel-barrow loads on a heap, the lesser the heaps are the better, so there be enough to make a good Fire throughly to consume the whole to ashes; if the Turf be full of fibrous roots, or hath a good head on it, it will burn without any other additional fewel; if not, you must raise your heap on a small bundle of Ling, Goss, Fearn or such like, which in some places they call Ollet, which will set the whole on Fire, you may afterwards let those little hills of *ashes* lie till they are a little saddned with rain, before you spread them, or take a quiet time that the wind may not waste your ashes, nor hinder their equal scattering; also you must pare the ground under the *hills* somewhat lower than the surface of the Earth, to abate its over-great fertility, caused by the Fire made thereon. It is also to be observed that the Land is to be but shallow or half Ploughed, and not above half the usual quantity of seed sown on an Acre, and that also late in the year if Wheat towards the end of *October*, onely to prevent the excessive rankness or greatness of the Corn, by which you may judge what advantage Burning is to the Land, and this also on the poorest Plants or Heaths.

Others there are that when they stubb up their *Goss*, *Broom*, and such like, lay the Roots on heaps when they are dry, and cover them with the parings of the Earth between where they raised the roots, and so Burn over the Land which is also a very considerable Improvement.

In some places also it is usual to Burn the stubble, and other trash they can rake together on their Lands, which must needs be very good so far as may be, according to the quantity thereof, although it be not so much used for fertility sake as to rid themselves of the stuff, as they usually burn Heaths and Turf-Commons to give liberty to the Grass.

Sir *Richard Weston* gives this for a good way, that is, First pare off the Heath [or Turf] then make the paring into little hills, you may put to one hill as much paring as comes off from a Rod or Pole of Ground.

The hills being sufficiently made and prepared, are to be fixed and burnt into ashes, and unto the ashes of every hill you must

put a peck of unslaked Lime, the Lime is to be covered over with the ashes, and so to stand till rain comes and flakes the Lime, after that mingle your ashes and Lime together, and so spread it over your Land.

In such places where Fewel is not scarce, and the Land barren, it is very excellent Husbandry to get together into such Land you intend to fertilize all the small Wood, Bushes, Furze, Broom, Heath, Fearn, Stubble, or what ever combustible matter you can procure, which in most places are easier obtained than dung, and in a dry time lay it in heaps disperfedly about the ground, and cast over it the parings of the Land where it lies and set fire to it, and whilest it burns, (having several to help you) cast on Turf or Earth on the most flaming parts to hinder that it flame not too much; the heat of which Fires will so calcine the Earth under them, and the Earth cast on them, besides the ashes of the vegetables, that it will yeild an increase far exceeding the charge and labor bestowed thereon, there can be no better use made of these combustible matters, and especially of the hawme or strings of Hops, which burnt in the Hop-Garden, and the parings of the Turfs on the side of the Garden, or elsewhere, or any other Earth cast over it as it burns, and then more hawme over that, and more Earth on that, as they use to say, *Stratum super stratum*, till all be done, either in one or several places, will make so excellent a Compost to be applyed to the Hop-hills, that none can exceed it, which I my self have done: And this answers to what

Continuatio
Miraculi
Mundi. p. 34

Glauber delivers as a great secret, and very profitable, Pertica Longurii; aut pali, quibus Vites lupulorum Caules sustinentur, si igne, qua in extremitatem suam inferiorem desuunt, adurantur, & extremitate adusta, in lignorum olcum illud immittantur, ut pinguedinem illam imbibant, &c. duplex hoc pacto emolumentum afferentis; primum est quod pertica a putredine conservata quotannis breviores non evadant, sed diutius durent: Alterum quod vitium & lupulorum radices pinguedinem et alimentum ex perticarum extremitatibus attrahentes luxuriante incremento excrescant. By which it appears that the ends of the Hop-poles onely being burnt and imbibed in his vegetable Oyle, or fixed Salt, will not onely endure long from rotting, but also will yeild extraordinary nourishment to the Roots of the Hops; of such wonderful efficacy is this subject, that the least Grain thereof carryeth with it much of fertility, as the same Author saith a little before of the same subject; *Non tantum in agris prestat, sed etiam arboribus, et vitibus, adeo ut una eodem plena, tota tantum ad agrorum stercorationem conferre valeat, quantum decem fimo equino, aut vaccine repleta plaustra solent.*

Page 21.

This kind of Manure either by Burning as before, or with the fixed Salts of any thing whatsoever, doth also much more enrich your Crop than any other Dung or Soyl, for this tendeth principally unto fertility, ordinary Dung of Beasts more unto the grosse substance of the Straw or Hawme, than unto Fruit or Seed, and also breeds more of Weeds than this our universal subject.

Osber Soyls
and Manures.

There are also several other sorts of Materials to be used as Solys

Soyls and Manures for the fertilizing and enriching of Lands; Some whereof are taken from the Earth, as *Chalk*, *Marle*, *Clay*, &c. Others from the Waters, as *Sands*, *Weeds*, &c. Others also are the Dungs and Excrements of living Creatures, and others that are several sorts of Vegetables themselves, and other casual things as *Soot*, *Raggs*, &c. Of all which we finde these whereof we shall now treat, to have been found out and commended to be useful and beneficial to the Husbandman for the purposes before mentioned.

Sect. 2.

Soyls and Manures taken from the Earth.

Whereof there are several sorts, some of so hard and undissoluble a nature, that it is not fit to lay on Lands simply as it is, but after it is burned into *Lime*, becomes a very excellent Improver of Lands: there are also other sorts of *Chalk* more unctuous and soluble, which being laid on Lands crude as it is, and let lie till the *Frosts* and *Rays* shatter and dissolve the same, prove a very considerable advantage to barren Lands; now where any of these *Chalks* are found it is good to prove their natures, by laying them on some small portion of Land crude as they are, or by burning them into *Lime*, if Fewel be plenty, or to half burn them, by which you may experimentally know, the true effects and benefits that *Subject* will yield.

And although *Chalk* simply of it self either burnt or unburnt, may not prove so advantageous as many have reported, yet is it of very great use to be mixed with *Earth* and the *Dungs* of Animals, by which may be made an admirable, sure, and natural fruitful Composition for almost any sorts of Lands, and raiseth Corn in abundance.

Liming of Land is of most excellent use, many barren parts of this Nation being thereby reduced into so fertile a condition for bearing most sorts of Grain, that upon Land not worth above one or two shillings an Acre well Husbanded with *Lime* hath been raised as good *Wheat*, *Barly*, *white* and *gray Pease* as England yields. *English Improver.*

Also that from a *Ling*, *Heath*, or *Common*, naturally barren and little worth, hath been raised most gallant Corn, worth five or six pound an Acre. *By the same Author.*

He also affirms that some men have had and received so much profit upon their Lands by once *liming*, as hath paid the purchase of their Lands, and that himself had great advance thereby, yet lived twenty miles from *Lime*, and fetched the same by Waggon so far to lay it on his Lands.

One Author saith twelve or fourteen quarters will *Lime* an Acre, another saith 160 bushels, the difference of the Land may require a different proportion.

The most natural Land for *Lime* is the light and sandy, the next mixt and gravelly; wet and cold gravel not good, cold clay the worst of all.

Also

Also a mixture of Lime, Earth, and Dung together, is a very excellent Compost for Land.

Of Marle.

Differences of Marle.

Signs of good or bad Marle.

Best way to know Marle.

Use and Benefit of Marle.

Marle is a very excellent thing, commended of all that either write or practise any thing in Husbandry. There are several kinds of it, some *stony*, some *soft*, *white*, *gray*, *ruffet*, *yellow*, *blem*, *black*, and some *red*: It is of a cold nature, and saddens Land exceedingly, and very heavy it is, and will go downwards, though not so much as *Lime* doth. The goodness or badness thereof is not known so much by the colour, as by the Purity and Uncompoundedness of it; For if it will break into bits like a Dye, or but smooth like Lead Oar, without any composition of Sand or Gravel; or if it will flake like Slate-stones, and purely flake or shatter after a shower of Rain, or being exposed to the Sun or Air, and shortly after turn to dust when its thoroughly dry again, and not congeal like tough Clay, question not the fruitfulness of it, notwithstanding the difference of colours, which are no certain signs of the goodness of the *Marle*. As for the *Slipperiness*, *Viscidusness*, *Fattiness*, or *Oyline*s thereof, although it be commonly esteemed a sign of good *Marle*, yet the best Authors affirm the contrary, viz. That there is very good *Marle* which is not so, but lieth in the *Mine* pure dry and short, yet nevertheless if you water it you shall finde it slippery. But the best and truest Rule to know the richness and profit of your *Marle*, is to try a Load or two on your Lands in several places, and in different proportions.

They usually lay the same on small heaps, and disperse it over the whole Field, as they do their *Dung*; and this *Marle* will keep the Land whereon it is laid, in some places ten or fifteen, and in some places thirty years in heart: It is most profitable in dry, light, and barren Lands, such as is most kinde and natural for *Rye*, as is evident by Mr. *Blithes* Experiment in his Chapter of *Marle*; It also affordeth not its vertue or strength the first year, so much as in the subsequent years. It yields a very great Increase and Advantage on high, sandy, gravelly, or mixed Lands, though never so barren, strong Clay Ground is unsuitable to it, yet if it can be laid dry, *Marle* may be profitable on that also.

It is very necessary in *marling* Lands to finde out the true proportion, how much on every Acre, that you add not too much, nor too little (*in medio virtus*.) Its better to erre by laying on too little than too much, because you may add more at pleasure, but you cannot take away; the surest way is to try some small quantities first, and proceed as your Experiments encourage. It hath been also experimentally observed, that you are to lay your *Marle* in the beginning of Winter on hard and binding Grounds. And on the contrary, you are to lay it in the Spring on light, sandy, dry, and gravelly Lands, but its good to try both; but its held to be best to lay it abroad in the beginning of the Winter, that the Frosts may first make the same moulder into small pieces, and so to become apt for Solution, which is done by the Rains that more plentifully fall in the Winter.

Of Fullers Earth.

You shall observe (saith *Markham*) that if you cannot get any perfect

perfect and rich *Marle*, if then you can get of that *Earth* which is called *Fullers Earth*, and where the one is not, commonly ever the other is, then may you use it in the same manner as you should do *Marle*, and it is found to be very neer as profitable.

Mr. *Bernhard Palissy* (that French Author cited so often by Sir *Hugh Platt*) commends the same, I have not known it at any time practised in *England* for the bettering of any ground (saith Sir *Hugh Platt*) but by all presumption the same must of necessity be very rich, because it is full of that vegetative Salt, which appears in these scouring effects, for the which it is divers ways had in use amongst us.

Clay is by many commended to be a considerable Improvement ^{Of Clay.} to some sorts of light and sandy ground, as *Sr. Hugh Platt* gives ^{Jewel House of Art and Nature.} the relation of a certain person that assured it to be most true that the very *Clay* which he digged up in *St. Georges Fields* being laid upon his pasture ground which he there held by lease did exceedingly enrich the same, inasmuch as he did never regard to seek after any other Soyl.

Also Mr. *Gabriel Platt* relates that he knew light sandy ground which was good for little or nothing, cured by laying thereon a great quantity of stiff *Clay ground* which converted it to good temperament whereby it became fruitful, and not subject to Soyl upon every light occasion as it did before, but would abide variety of weather according to the nature of *Hassel-ground*; And this Improvement (saith he) is of no little value, for there is a great difference betwixt Land that is subject to fail once in two or three years, and Land thus improved that will not fail once in two or three and twenty years through the distemperature of the weather.

Mr. *Bernhard* also affirms that all *Marle* is a kind of *Clay ground*, and it should seem to differ onely in digestion from *Marle*.

It is good to try it on several grounds both *Arable* and *Pasture*, and for several Grains, at several times in the year, and in several proportions, by this means you may find out the true value and effect of this, and by the same Method of all other *Subterraneal Soyl or Manure*, and thereby raise unto your self a considerable advantage.

By the same Rule and for the same Reason that *Clay* advanceth ^{Of Sand.} the benefit of light and Sandy grounds, may *Sand* be an enrichment and Improvement to cold *Clay grounds*, As Mr. *Gabriel Platt* testifieth that he hath known stiff *Clay grounds* that would seldom be fruitful unless the season of the year proved very prosperous, to have been cured by laying thereupon a great quantity of light *Sandy ground*, which afterwards was converted to a good temperament, like to the sort of ground commonly called *Hassel-ground* which seldom or never faileth to be fruitful.

The best *Sand* for fertility is that which is washed from the hills or other *Sandy* places by the violence of *Rain*; other *Sands* that are digged, have little fertility in them, onely by way of contracting to *Clay ground* they may effect much, as *Columella* saith, that

that his Grandfather used to carry *Sand* on *Clay*, and on the contrary to bring *Clay* on *Sandy* grounds and with good success.

Sand also is of great use to be mixed with *Soyl*, as Mr. *Elish* adviseth, for the speedy raising of great quantities of *Soyl* in the Winter by the sheep when foulding is generally neglected, and that is by making a large Sheep-house for the housing of thy Sheep in Winter, which may be Sheep-cribbed round about and in the middle too, to fother them therein, you may bring herein once or twice a week several Loads of *Sand* either out of the streets or ways, or from a *Sand-pit*, and lay it three or four inches thick, and so continue once or twice a week as long as thou pleasest, and what with the heat and warmth of their bodies and the fatness of their Dung and Urine, the *Sand* will turn to excellent rich *Soyl*, and go very far upon thy Land, and be more serviceable than thou canst conceive.

Of Earth.

There are several sorts of *Earth* that are of singular use for the bettering of Land, as all *Earth* of a *Saltish* nature is fruitful, especially all such *Earth* as lies dry covered with Hovels or Houses, of which you make *Salt-petre*, is rich for Land, and so are old Floors under any Buildings.

Mr. *Platt* affirms that he hath known many hundred loads of *Earth* sold for twelve pence a load being digged out of a Meadow near to *Hampton-Court*, which were carried three or four miles to the higher grounds, and fertilized those grounds wonderfully, and recompensed the labour and charges very well; which *Earth* being laid upon *Arable* Land within a Furlong of the same Meadow did more hurt than good, which sheweth that the *Earth* must be of a different nature from the Land whereon it is laid.

Also any sort of *Earth* may be made use of for the folding of Sheep thereon under a Covert, after the *Flanders* Manure, as before is said of *Sand*.

All sorts of *Earth* are very useful to intermix with *Lime*, *Dung* of Beasts, *Fowl*, or any other fatty substance being laid, *stratum super stratum*, in pits or on heaps to putrifie together, as well to moderate the quality as to increase the quantity of your *Soyl*.

Sect. 3.

Soys taken from the Sea or Water.

Of water-Sand.

The richest of all *sands* is what comes from the *Sea-coasts* and the *Creeks* thereof, and all Lands bordering on the *Sea* may be improved by them, it is the usual practise in the Western parts of this Land for the people to their great charge in carraige to convey the *Saltish Sands* unto their barren grounds, whereof some of them do lie five miles distance from the *Sea*, and yet they find the same exceeding profitable, for that their inheritance is thereby enriched for many years together, the greatest vertue consisting in the *Saltishness* thereof.

Others say the Richness of the *Sands* is from the fat or filth the *Sea* doth gather in by *Land-floods*, and what the *Tide* fetches daily from

from the shores, and from fish and from other matters that putrefie in the Sea, all which the Water casts to shore, and purgeth forth of it self, and leaves in the Sands thereof, while it self is clean and pure.

The Sands of fresh Rivers challenge also a place in our Improvements being laid on Land proper for the same, but more especially if it be mixed with any other matter as most usually it is, where it is cast on shelves at the falls of some Land-waters descending from Hills or High-ways.

In Devon-shire and Cornwall, and many other parts they make a very great Improvement of the Sea-weeds for the Soyling and Manuring of their Land and that to a very great advantage. *Of Sea-weeds, and Weeds in Rivers.*

All manner of Sea-owse, Owfy-mud, or Sea-weeds, or any such like growing either in the Sea or fresh Rivers, whereof there is a very great quantity lost and destroyed, are very rich for the bettering of Land.

In Cornwall there is also a Weed called Ore-wood, whereof some grows upon Rocks under high Water-marks, and some is broken from the bottom of the Sea by rough weather, and cast upon the next shore by the Wind and Flood, wherewith they Compost their Barly Land.

Of Snayl, Cod, or Snag-greets.

It lieth frequently in deep Rivers, it is from a Mud or Sludge, it is very soft, full of Eyes and wrinckles, and little shells, is very rich, some they sell for one shilling two pence the Load, another sort they sell for two shillings four pence the Load at the Riverside, which men fetch twenty miles an end for the Inriching of their Land for Corn and Grasse, one Load going as far as three Load of the best Horse or Cow-dung that can be made; It hath in it many Snails and Shells, which is conceived occasioneth the fatness of it.

I am very credibly informed that an Ingenious Gentleman living neer the Sea side, laid on his Lands great quantities of Oyster-shells, which made his neighbours laugh at him (as usually they do at any thing besides their own clownish road or custom of ignorance) for the first and second years they signified little, but afterwards they being so long exposed to the weather and mixed with the moist earth, they exceedingly enriched his Lands for many years after; which stands also with reason, the Shells of all such Fish being onely Salt congealed into such a forme, which when it is dissolved of necessity must prove fertile. *Of Oyster-shells.*

There is in most Rivers a very good Rich Mud of great fruitfulness, and unexpected advantage, it costs nothing but labour in getting, it hath in it great worth and vertue, being the Soyl of the Pastures and Feilds, Commons, Roads, Ways, Streets, and Backsides, all washed down by the flood, and settling in such places where it meets with Rest. *Of Mud.*

There is likewise very great fertility, in the residence of all
O Channels,

Channels, Ponds, Pools, Lakes, and Ditches, where any store of Waters do repose themselves, but especially where any store of Rain-water hath a long time settled.

Of Fish.

In Forreign parts where *Fish* are plenty they prove an excellent Manure for Land, in some places here in *England* there are plenty of some sorts of *Fish*, and at some seasons not capable of being kept for a Market, it were better to make use of them for our advantage than not; I presume they are of the best of Soyls or Manures, but herein I submit to experiment.

Doubtless there is not any thing that proceeds from the Sea or other Waters whether it be *Fish* or the Garbidge of *Fish*, Vegetables, Shells, Sands, or Mud, or any such like dissolving matter, but must be of very great advantage to the Husbandman, if duely and judiciously applied.

Sect. 4.

Of Dungs or Excrementitious Soyls.

Of Horse-dung

This is the most common of any Dung whatsoever, by reason that Horses are most kept in Stables, and their Soyl preserved yielding a considerable price in most places, the higher the Horses are fed the better is the Dung by far, it is the onely Dung in use whilest it is new for hot Beds, and other uses for the Gardiner.

Of Cow, or Ox-dung.

Next unto the Horse-dung is Cow-dung, whereof by reason of its easie solution, hath been made the Water wherein Grain hath been steeped, and hath deceived many a plain meaning Husbandman, for there is not that richness nor vertue therein as many judge, for that purpose.

Of Sheep-dung.

But this together with Horse-dung, or other Dung, is of very great advantage to Land if it be kept till it be old, and not laid abroad exposed to the Sun and Wind, as is the practise of the several ignorant Husbands, letting of it lie spread on their Field Lands three or four of the Summer months together, till the Sun and Aire hath exhausted all the vertue thereof, which if it be laid on heaps with Earth mixed therewith, and so let lie till it be rotten, it will be the sooner brought to a convenient temper, and on Pasture grounds brings a sweeter Grass, and goes much farther than the Common way, and spread before the Plough produces excellent Corn; It is also to be used with judgement, for ordinary Dung used the common way in some years doth hurt, and sometimes make Weeds and trumpery to grow, which ordered as before, is not so apt for such inconveniences. Of all Beasts, Sheep yield the best Dung and therefore is most to be praised, it is a very high Improvement to the common Field-lands where there is a good Flock duly folded on them, especially where it is turned in with the Plough soon after the fold, the onely way to improve your Sheeps-dung to the highest advantage, is to fold them in a covered fold with intermixture of Earth, Sand, &c. as before, and by this means we may make our Sheep enrich most of our barren Lands.

Sheep-

Sheeps-dung is very excellent being dissolved wholly (as it will be if well squeezed) to steep Grain therein, for the Grain doth very eagerly imbibe the whole quantity of the Dung into it self, except onely here and there a treddle undissolved, and proves a great Improvement if rightly ordered.

Great quantities of this Dung might be obtained if poor Women, and Children were imployed to pick up the same on the Rode-ways, and burning tops of hills where it seldom doth any good, but would prove much more advantageous than the cost or trouble, by far.

This hath in former ages been esteemed the worst of Dungs ^{Of Swines-}very hurtful to Corn, a breeder of Thistles, and other noisome Weeds. ^{dung.}

But our late Husbands (whose experience I rather credit than ^{English Im-}an old vain tradition) say 'tis very rich for Corn or Grasse, or any ^{prover.}Land, yea of such accompt to many ingenious Husbands, that they prefer it above any ordinary Manure whatsoever, therefore they make their Hogs-yards most compleat, with an high Pale paved well with Pible or gravel in the bottom, &c. they cast into this yard their Cornish Muskings, & all Garbidge, and all Leaves, Roots, Fruits, and Plants out of Gardens, Courts, and Yards, and great store of Straw, Fern, or Weeds, for the Swine to make Dung withal, some Hog-yards will yield you forty, some sixty, some eighty Load of excellent Manure of ten or twelve Swine.

Its most likely that this Manure so made by these large additions is more natural and kindly to Land, than the bare Swines-dung it self, and must of necessity prove a very high advantage considering the despicable vile state of this Beast.

Some good Daries will make the Soyl of their Hog-yard produce them twenty or thirty pounds worth of profit in a year.

Of the Dung of Fowl.

This challengeth the Priority not onely of the Dung of Fowl, ^{Of Pigeons-}but of all other Creatures whatsoever. ^{dung.}

Pigeons or Hens-dung is incomparable, one Load is worth ten Load of other Dung, and therefore its usually sown on Wheat (or Barly) that lieth afar off, and not easily to be helped, its extraordinary likewise on a Hop-garden.

A Load of Pigeons-dung is more worth than twenty shillings in many parts, a very excellent Soyl for a cold moist natured Land.

I have caused it to be sown by hand after the Grain is sown, and in the same manner, and then harrowed in with the Grain, and received a very great increase on poor Land.

I have known (saith Platt) a Load of Pigeons-dung fetched sixteen miles, and a Load of Coals given for it, which in the Soyl where it was fetched would have done more hurt than good for the Manuring of Land, yet where it was carried, it did as much good for the fertilizing of Land as double the charges; In the

one Soyl it cured the barrenness, and in the other it poisoned the fertility.

*Of the Dung
of Poultry.*

This Dung is of less esteem, because it is not obtained at so easie a rate, and where it is, its generally little set by, because our Fore-fathers did not make any great matter of it, and because they understand not the strength and power of it; for when they take it out of the Hen-houses its of a very hot nature, and must needs injure some things, if laid thereon; but if it be mixed well with Common Earth, Sand, or such like, and let lye till it rot well together, you will finde it a very rich Manure, and of value to answer a great part of your Poultreys expence.

I have known a Quince-tree whereon Poultry always pearched, that by reason of the Rain washing to its Roots the salt and fatness of the Dung, did bear yearly an incredible number of very excellent Quinces.

*Of Goose dung
Markham.*

This hath been held by the Ancients to be most hurtful and unprofitable to any Grounds. They say that to good Grasse they are a great enemy, for their Dung and treading will putrifie it, and make it worse than barren.

I have it from a credible hand, that Goose-dung is very advantageous to Corn, it being discovered by a flock of Geese daily passing over-thwart a Field of Wheat, making as it were a Lane over the same in the Winter time, and had nibbled the Wheat clean from the Ground, and dunged it where they went; in which passage the next year proved to be very gallant Wheat, far exceeding any other part of the Field.

Like unto that I have heard, that a Flock of Wilde-geese had pitched upon a parcel of green Wheat, and had eaten it up clean, and sat thereon, and dung'd it several nights; that the Owner despaired of having any Crop that year, but the contrary happened; for he had a far richer Stock of Wheat there than any of his Neighbours had in the Land adjoining, to the admiration of all.

Which demonstrateth that this Dung is of a very hot and fiery nature, which occasioneth that barrenness falsely suggested to be in it, and being laid abroad thin in the Winter time, proves a very rich Manure, and therefore to be esteemed of; and being mixed with cooling Earths, and let putrifie sometime, may prove very much for your benefit, therefore neglect it not, but make several tryals, the Advantage will be your own. The same may be said of the Dung of any other Water-fowl.

*Of Urines.
Explicatio
Miraculi
Mundi. p. 50.*

Although that Urines are esteemed to be of a destructive and mortifying nature to Vegetables, as *Glauber* affirms, by reason of its Salarmoniackal and burning Spirit that is therein, as is evident to our Senses upon the casting of new Urine on Nettles or other Vegetables, it soon destroyeth them: But it is with this, as with many other moist things subject to putrefaction, time will digest it, and alter the nature and property thereof, as it doth Wine or Beer into Vineger, so it will of this fiery matter produce an excellent Soyl, as many have had the experience of.

Mr.

Mr. Hartlib testifieth, that in Holland they as carefully preserve the Cows Urine as the Dung, to enrich their Land, *Columnella* in his Book of Husbandry saith, *That old Urine is excellent for the Roots of Trees.*

I know a woman (saith Mr. Hartlib) who liveth five miles south of *Canterbury*, who saveth in a Pail all the Urine, and when the Pail is full, sprinkleth it on her Meadow, which causeth the Grasse at first to look yellow, but after a little time it grows wonderfully.

Another also saith, That Mans Urine is of great worth, and will fatten Land more than you are aware of, and it were not till Husbandry to take all opportunities to preserve it for thy Land, and so of all other Urines, after the Dutch manner. English Improver.

Humane Ordure ought not here to be omitted as a rich Soyl, if the Husbandman would be so careful as to place his Houses of Office, that he may once in two or three days adde some mixture of Earth, Straw, Stubble, or such like, to reduce it into a necessary Substance portable into your Lands or Grounds remote from your Dwelling, where after it hath layen some convenient time in a heap to putrifie together, and then thinly dispersed, proves an unexpected Advantage.

Sect. 5.

Of several other Soyls or Manures.

Ashes contain in them very much of a rich and fertile Salt, as before we noted, and therefore not so much to be slighted and neglected as they are, be they of what kinde or nature soever. After.

Virgil. ————— *Nepudet,*

Effatos Cinerem immundum jactare per agros.

The Wood-ashes are the best and very useful, yet after they have been used in the Bucking of Gloathes, they are worth little unless it be in cold and moist Land, where I have known them also to avail much.

Sea-Coal ashes with Horse-dung, make an excellent Compost for divers uses.

Turf and Peat-ashes must needs be very rich, being much after the same manner as the Burning of Land, which most know to be a very great Improvement, and whereof we have already treated.

Ashes are a great Curer of Moss and Rushes in moist Grounds.

The Ashes of any sort of Vegetables are very profitable, as divers places in *England* can testifie by experience, who consume their Fearn, Stubble, Straw, Heath, Furs, Sedge, Bean-stalks, and the very Sword and Swarth of their Ground to ashes; and these according to the store of Salt which their Ashes do contain, do either for a longer or shorter time enrich their barren Grounds.

The same Author highly commends Soap-ashes, after the Soap-boylers have made what use of them they please, to be a very great enriching to Land; and gives you an instance of a Stalk and Ear of

of Barley of an Ell and three Inches in length, that grew on barren Land, enriched with Soap-ashes; he also saith he found the like success in Pasture Ground.

In *Lombardy* they esteem them much above other Dung.

Its best to lay them either on Corn, or Pasture, or Meadow, in the beginning of Winter, that the showers may the easier dissolve them.

Soot.

Soot also is affirmed by some to be very good, especially that which is made of Wood. Its most beneficial to Trees or Plants that either grow in the shade, or to cold and moist Grounds.

Salt.

I mean Common Salt may prove advantagious, if used with moderation and discretion, as well to saltish Sands, Muds, Earths, &c. Some commend very much the sweeping of a Ship of Salt, or drop-sie Salt and Brine.

It is of singular use, as daily experience testifies, being dissolved and Seed-corn steeped therein, to prevent the Smut, and add fertility, as we noted before in the Preparation of the Seed.

There is also a relation of one that sowed a Bushel of Salt long before on a small patch of barren Ground at *Clapham*, which to that day remained more fresh and green, and full of Swarth than all the rest of the Field about it; This, though not a beneficial Experiment, by reason of the price of Salt, yet a plain demonstration of the Fertility that is in Salts, and gives us encouragement to make use of the Brines of Salt-pits, or such like, now not in much esteem.

Rags.

In Rags of all sorts there is good vertue, they are carried far and laid upon Lands, and have in them a warming, improving temper, one good Load will go as far as half a dozen or more of the best Cow-dung.

Hair, &c.

Divers also have found singular profit in the Hair that is gotten from the Hides of Beasts, being thinly laid upon the Ground, and suffered to putrefie.

Also course Wooll-nippings and Tarry Pitch-marks, may be reckoned into the number, having great vertue in them.

Mault-dust.

Mault-dust is commended as an Enricher of barren Lands, but because great quantities are not to be had thereof, it is best to be used in Gardens, where you will finde it to be of singular use.

Fearn, Straw, Stubble, &c.

All sorts of Fearn, Straw, Brake, Stubble, Rushes, Thistles, Leaves of Trees, or any manner of Vegetable Trash whatever, either cast into the yards amongst the Cattel or Swine, or cast into pools or places to rot in, or mixed with other Soyls, help very much, and make very good Compost.

Bones, horns, sinking fish, &c.

All Marrow-bones, Fish-bones, Horn or shavings of Horn, or Liquors wherein Flesh or Fish have lain, or any other thing whatsoever that hath any oyliness or fatness in it, is useful in Husbanding thy Lands.

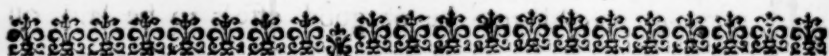
It were not much labour to try whether the bones of Horses or other Beasts, whereof there are great quantities at some Dog-kennels,

kennels, which if being burnt in heaps with some small addition of Fewel would not be of good effect to be laid on Lands.

There is in all Bark a very rich Salt, but in the Oaken-bark ^{Bark of Trees.} the most which is made use of principally by Farmers, but such Barks or Rinds of Trees not of so high a value, being broken into small pieces must of necessity enrich either Corn or Pasture ground being laid thereon; It must needs be much richer than ^{Earth in wgt. low-trees.} the mould or Earth usually found in the bodies of old, large, and hollow Willow-trees, that are putrified within, which is esteemed to be so rich and effectual.

Amongst the Coal-Mines they usually dig a kinde of blew, or black Clay that lies neer the Coal, and is as it were an unripe Coal, which the Country-men commonly call *Urry*, ^{Urry.} which they lay on their Pastures with wonderful success, and is very proper for warm Lands.

CHAP.



CHAP. VI.

*Of the Benefit, Raising, Planting, and Propagating
of all sorts of Timber-trees, and other Trees useful
either in Building or other Mechanick Uses, or
for Fencing, Fuel, &c.*

Sect. I.

*Of the Benefit of Propagating Timber Trees, and other
Trees in general.*

THE Propagation of *Woods* or *Trees* is none of the least Improvements that can be made on most of the Lands in *England*, for the particular advantage, and pleasure of the Countryman, and in raising the yearly profits of his Farm, and very much advancing the price of the purchase thereof over and above the Annual gain, and nothing can render a Seat more delectable and pleasant than *Wood* and *Water*, but principally the curious *Groves* surrounding or bordering near it.

What can be more profitable than *Woods* or *Trees*, which will thrive, and increase on the most barren, and unfruitful Land, be it either wet or dry, cold, mountainous, uneven, remote, or never so inapt for any other manner of Culture, where neither Corn, Grass, or any other necessary or useful Vegetable will hardly grow, yet may we there perceive the lofty Woods flourish far exceeding in Value the purchase of the Land without them, and instead of injuring the Land whereon they stand, it is much bettered and capacitated to bear till age at the removall of the Trees; also the other bordering grounds yield a greater encrease of Corn or Grass, by their defence from the extremity of the cold, and bitter blasts in the Winter, and the scorching drought of the Summer.

And what can be more pleasant than to have the bounds and limits of your own Propriety preserved, and continued from age to age, by the Testimony of such living and growing witnesses, in the Spring yielding a reviving Cordial to your Winter-chilled spirit, giving you an assurance of the approaching Summer, by their pregnant Buds, and Musical Inhabitants: In the Summer what more delectable than the curious prospect of the variety of Greenness, dark shades, and retirement from the scorching Sunbeams? The Autumn and Winter also not without pleasure and content for the active Husbandman.

As for the more particular advantages and benefits of planting Woods and Trees, you shall find that.

First, It improves and meliorates the Land it self; for those Lands where Woods have formerly stood, and are now grubbed up or taken away, the ground is very good, and rich, and bears excellent Corn, or any other Tillage or Grasse, although the ground was before the planting or growing of those Woods, barren, lean, and thin, as may appear by the bordering Land on either side of such Woods that were never planted.

Secondly, The Annual profits of most Land planted with Coppice-woods are much greater, than if the same Land were used for Corn, Grasse, or such like; For I have known on a hill, Land not worth for Corn, or Grasse, above five shillings per Acre, that at twelve years growth the Coppice-wood thereon growing, hath been sold at the rate of twenty pounds per Acre, and at the next felling at seven years growth it is like to be of the same value, it coming much thicker, and being better preserved than at the first, which is a very considerable advance of the value or profits, besides it is not subject to those casualties and hazards that Corn, Cattel, &c. are subject unto; It will also bring in an Annual profit if you divide your Coppice into so many parts as you intend it shall stand years, before it be felled, then may you every year sell a part: as if you have ten Acres, you may every year sell one Acre at ten years growth.

The better and lighter your Land is, the greater will your increase be, which may in some sort (if the Land be very good) make good the Improvement; Mr. Blyth instances in his *Improver Improved*, of a new Plantation that at eleven years growth, a fall was made, and so much Wood cut upon the same as was worth or sold for sixty pounds per Acre or more, it was much Pole-wood, yea a good part of it made Spars, and some part of it small Buildings Timber, &c. the Land was worth about ten shillings per Acre, digged and planted with quicksets.

The same Author also gives very great encouragement for the planting of Poplar, Willow, and Alder, on wet, morish, or boggy Land, to the advancement of Land not worth two shillings an Acre, unto five pounds an Acre at seven years growth, which is the least I am confident, if it be carefully ordered.

Thirdly, The Benefit and Advantage is very great that is raised from Timber and other Trees standing singly, and in Hedge-rows, Avenues, or any other way disposed or ordered about your Houses, Lands, Commons, &c. that a man may plant, and in a few years himself or his successors may reap the benefit.

Mr. Blyth gives you an instance of one that planted one hundred *Ashes*, and at the end of fifty years sold them for five hundred pounds; And of another that planted so much Wood in his own life, that he would not take 50000 l. for.

For Ash, Elm, Poplar, Willow, and such Trees that are quick of growth, it is a very great profit that is made of them where Fewel is scarce, by planting them in Hedge-rows, and other spare places,

and shrouding them at five, six, eight, or ten years growth, they constantly bear a good head, and every time whilest the Tree is in proof, the shrouds encrease. They are out of the danger of the bite of Cattel, and require no Fence.

Fourthly, Another main Benefit accrews to the industrious Husbandman from the propagation of Trees in Hedge-rows, and Out-bounds of his Lands, it gives a check to the fierce cold Winter Blasts which nips the Winter Corn, and finely refrigerates the Air in the Summer parching Heats, and qualifies the dry and injurious Windes both in Spring and Summer. Let the Champion Farmers object what they please, there's no Field Champion Land of that yearly value for either Corn or Pasture, as is the Wood-land, I know no other reason for it than the natural warmth and defence thereof by the Fences and Trees, else why should an Enclosed and well planted piece of Several, yield so much more certain Rent than the Land in the like nature in Common and Open, lying but on the other side of the Hedge obvious to the injurious Airs, although both converted to the same use.

Fifthly, Trees planted *Sparfimi* here and there in the Hedge-rows, and other places of your Land, prove an excellent shelter for Cattel in the Winter, to preserve them from cold Storms and Windes, and also in the Summer from the scorching Sun-beams, else would the Cattel destroy more with their feet than they eat with their mouthes, and loose more fatness in one hot day than they gain in three cool days.

More universal
Advantages.

These universal Advantages also accrew to those Places or Countreys well planted with Woods and Timber.

First, There is a constant supply of Timber for the Building of Ships, the Bulwarks and Defence of this *Nation*, and for the Redifying of Towns or Houses destroyed by Fire, or other Casualties; and for the Building, Maintaining of, and Repairing of all Houses, Barns, and other Edifices. And also it yieldeth us a continual Recruit of necessary Bootes, Instruments, and Materials for all our Rural and Mechanick Uses; as for our Mills, Carts, Ploughs, &c. and for Turners, Joyners, and other Wooden Trades; also for the maintenance of the Grooves or Pits of Lead, Coal, and other Mines under the Earth, that where plenty of Woods and Trees are, they need not be enforced to fetch these Materials afar off, at a great expence and labor. In some places they fetch most of the Necessaries aforesaid near twenty miles on Horse-back, when the Land at the same place where they need it, is as capable of bearing it as the place from whence they bring it.

Secondly, Where Woods are raised and maintained, there is a constant Supply of Fewel. The difference may be very easily discerned between the *Woodlands* and the *Champion*; in the one you have Fewel in every house, as well poor as rich, of good Wood; in the other, the Rich have it but little, and that at extraordinary Rates, and the poor none but what they filch and steal from the Rich; or if their honesty exceed their necessity, they either sit and starve with Cold, or burn Stubble of Corn, or Cow-dung dried,

dried, or the Parings of the Earth, or such like, that the other make use of for the Improvement and Manuring their Land.

Thirdly, The Tanners Trade depends upon the Oaken Trees, therefore where they are scarce, there must of necessity be a defect of that Occupation, which must in fine prove prejudicial to the whole Nation.

Fourthly, Where Beech, Oak, Hazel, and such like Mast-bearing Trees are in any considerable quantity standing, they yield a very good Food for Swine, of no small value to the Husbandman in such years they take.

We shall therefore give you a Brief Catalogue of such Trees as usually flourish in our English Soyl; the places they most delight in, the most natural and likely way of Propagation, and their uses, and what other Observations we have met withal concerning them. And first,

Sect. 2.

Of Timber Trees in particular.

There is no Timber natural to our English Soyl exceeds the Oak, *The Oak* for its Plenty, Strength, and Dureableness; where better or stronger Ships for the War, than those built of Oak? And what Timber more lasting or strong than Oak in our Rural Edifices? It is a *Plant* Tree universally known, and will grow and prosper in any Land, good or bad, Clay, Gravel, Sand, or mixed; warm, cold, dry or moist, as experimentally appears by its growth in several places of contrary natures or tempers; but they do most affect the sound, black, deep, and fast Mould, rather warm than over-wet and cold, and a little rising, for this produces the firmest Timber; although I have known them thrive very well in extraordinary cold, moist, and clay ground, that a Tun of Timber could not be thence haled, unless in the dry and Summer season, but that the Wheels would sink in the Clay to the Axle-tree. They will also grow, though but slowly, on the high, stony, and barren Hills.

The Acorns, or Oaken Mast, being sown in your Nursery, after *propagation* they are full ripe, and before they are withered (which will quickly be if they lye open in the Air) will the next Spring yield you plenty of young Plants, which you may order and transplant, as hereafter in the Nursery you shall have Directions.

Or for expedition sake, you may have young Sets drawn by those that seek the Woods for Quick-sets, in such places where Acorns have spontaneously grown, and been sheltered from Cattel till they are fit for a remove; but these prove generally crooked and ill shaped, and so are to be cut near to the ground when you plant them, by which means they will emit another shoot more straight.

Oaks also prosper very well in Coppices, being felled as other Under-woods are. It is reported that a Lady in *Northamptonshire* *Sylvia* sowed Acorns, & lived to cut the Trees produced from them twice in two and twenty years, and both as well grown as most are in sixteen or eighteen; Also that Acorns set in Hedge-rows, have in thirty years born a Stem of a Foot Diameter.

Uſe.

The ſeveral uſes of Oaken Timber for Buildings, and other Mechanick uſes is ſo univerſally known, that it is but needleſs to renumerate them. To abide all ſeaſons of the weather, there is no Wood comparable unto it, as for Pales, Shingles, Poſt, Rails, Boards, &c.

For Water-works alſo it is ſecond to none, eſpecially where it lies obvious to the Aire as well as the Water, there is no Wood like it; For Fewel either aſ it is, or made into Charcoal, there is no Wood equals it.

The Bark alſo for the Tanner and Dier, exceeds all other Barks, the very Saw-duſt, and aſhes alſo of the Oake challenge a preference, the Maſt exceeds any other Maſt of the Forreſt-trees.

The Elm.

The Elme is one of the moſt eaſie Trees to propagate, and delighting in moſt ſorts of ground, except onely Land very dry, hot and parching, ſhallow Land neer Chalk, or Gravel, on the tops of Hills it thrives not well on, yet it will grow almoſt in any place.

But the places it principally delights in, is the level, light, and looſe Land, whether dry or moiſt, on the banks of ſuch level and fertile grounds, whether they be of Gravel, Earth, or Chalk, the Elme proſpers well.

Propagation.

About the beginning of *March* fall the ſeeds of the Elme, which being ſown in your Nurſery, will yeild you Plants. But the care and trouble thereof is ſuperfluous, ſeeing there are newer, and more expeditious, and advantagious ways known, *viz.* by the Suckers.

Which are produced in great plenty from the roots of the Elme, and may be tranſplanted into any places; where the Elms grow great plenty of theſe Suckers will yearly ſhoot out of the Earth if Cattel be kept from them, or if any Elme be felled the old Roots will yield plenty of Suckers, or if the old Roots be chopped or ſlit, and ſlightly covered with light mould, they will ſend forth plenty of Suckers, all which may be ſlipped off, and tranſplanted even unto any bigneſs; There being no Tree more eaſily tranſplanted and with good ſucceſs than the Elme, obſerving theſe Cautions, that if you remove them very young that you cut not off the top, becauſe it is ſappy, and the wet will be apt to get in, and decay the Plant, being weakened by his removal, but the greater you muſt be ſure to diſbranch, leaving onely the ſtem; ſome cover alſo the head of ſuch Elme ſo cut off, with a mixture of Clay, and Horſe-dung.

I have been very credibly informed, that a certain Gentleman in the North Country, having a deſire to raiſe ſuddenly a Plump or Grove of Trees about his Manſion Houſe, there being a great ſcarcity of Wood in that place, obtained a parcel of Elme-trees, lops, and tops, and made Trenches or Ditches in the Earth, and cut his Elm branches, &c. into ſeveral lengths of ſix, eight, ten, or twenty feet in length, as with beſt conveniency he could, and buried them ſingly in the Trenches ſo digged, and covered them wholly from the one end to the other, leaving onely a hole open about the

the middle of the interred branch, or if it were a long peice then two open places might be left, out of which places did spring forth several shoots the first year of a very great length; the Winter succeeding he took these branches or shoots all, save onely the fairest, and which was most probable, and likely to thrive, and so filled up the hole about it, by which means they grew to a prodigious height in a few years, that his habitation was compleatly adorned with living aspiring products of his ingenious attempt: Note, that the true time of this *Sepulture* is when the sap is full in the Tree, when the Leaves are newly sprung, for then the great quantity of the sap that is in the whole branch, forceth it self into those shoots or Cions that then have found a passage; also for the succeeding years the whole Tree in the Earth becomes a main principal nourishing Root to the nimble growing Tree.

If the Elme be felled between *November* and *February*, it will be *Use*. all Spine or Heart, or very little sap, and is of most singular use in the Water where it lies alwayes wet, and also where it may lie alwayes dry; it is also a timer of great use for its toughness, and therefore used by Wheel-wrights, Mill-wrights, &c. It is also good to make Dressers, and Planks to chop on, because it will not break away in chips like other Timber.

The Elm is also good Fewel, and makes very good Charcoal, the Branches and Leaves also of this Tree are good food for Cattel, in the Winter where other fodder is dear, they will eat them before Oats.

The Elm is also a most pleasant Tree to Plant in Avenues or Walks, it growing so streight, and upright, and mounts to the greatest height of any other Tree in so short a space; It will grow the neereest of any other together being very sociable, and affecting to grow in company, and spreads its Branches but little to the offence of Corn, or Pasture grounds; to both which, and the Cattel, it affords a benign Shade, Defence, and agreeable Ornament.

This Tree is also very flexible, and to be reduced into what form or shape you please for shade, and delight; it also springs earlier than most other Forrest-trees.

This Tree commonly grows to a great stature, delights most *The Beech*. in warm Land, it grows plentifully in Gravelly, Stony, and Sandy Land: great Beechen-woods I have seen on the dryest barren Sandy Lands, they delight on the sides, and tops of high hills, and Chalky mountains, they will strangely insinuate their Roots into the bowels of those seemingly impenetrable places.

This is raised from the Mast as the Oake, and from young plants *Propagation*. drawn by the Quickset-gatherers, and planted as the Oak, it grows but slow whilest it is young, but when the Beech is gotten a little out of the way, no Tree thrives better, nor sooner attains to a large bulk than this Tree, and although it be crooked, knotty, and ill shapen whilest it is young, yet will it overcome all those, and prove a streight and compleat Tree.

Its use is principally for the Turner, Joyner, Upholsterer, and *Use*. such

such like Mechanick Occupations, the Wood being of a clean white, and fine Grain, and not apt to rend or slit, it is sometimes used in Building; It is also very good Fewel, burning cleer, and light, and makes good Charcoal though not long lasting: the Mast feeds, Swine, Deer, Pheasants, &c.

This Tree planted in Avenues or Walks yield a most delectable and agreeable shadow all the Summer, few or none exceeding it for colour and shade.

Sylva.

The leaves also gathered about the fall, and somewhat before they are much frost-bitten, afford the best and easiest Mattresses in the world to lay under our Quilts instead of Straw, and continue sweet for seven or eight years.

The Ash.

The Ash is a gallant quick-thriving Wood, it delights in the best Land, and will prove well in almost any sort of Land whatsoever, and will also grow in the hard, barren, mountainous Land, but not so well for Timber, as in Coppice Woods and Pollards, to be shrouded or lopped, being so ordered they refuse no place. The best Ash grows in the best Land, yet is it not convenient to plant them neer Plough-lands for the Roots hinder the Coulter, and exhaust the fertility of the Soyl; the dripping also is injurious to Corn.

Propagation.

It is propagated from the Seed or Keyes, which being gathered in *October* or after, when they begin to fall, and sown in your Nursery, the next spring come twelvemonth they will appear, and will afterwards thrive, and prosper very well, they are to be removed whilest they are small because of their speedy deep rooting, take not off the tops of the small young Ash because it is a sappy plant; But of the greater sets its best to cut them neer the ground, and then will they send forth new shoots, which will soon supply the defect of the other, which may also be done in all young Ash after they are well settled, and it will cause to shoot large, and thriving shoots: I have seen the experience of it in such plants that stood several years, and every year decayed till cut off at the roots, and then they did wonderfully thrive.

You may also have plants drawn by those that draw quicksets, &c.

Use.

The use of the Ash is almost universal, good for Building or any other use where it may lye dry, serves the occasions of the Carpenter, Wheel-wright, Cart-wright, Cooper, Turner, &c. For Garden uses also no Wood exceeds it, as for Hop-poles, Pali-fade-hedges, and all manner of Utensils for the Gardner or Husbandman.

For Firing there's no Wood comparable to it, for a light sweet burning, it will also burn better newly cut than any other Wood.

The onely season for setting the Ash for use, is from *November*, till the end of *January*, for if the sap be never so little in the Tree, the Worm takes it, and spoils the Wood in a short time.

There is no Timber of so speedy a growth as the Ash, that it is related that an Ash at forty years growth from the Key, hath been sold for thirty pounds, Mr. *Blith* also inserts a president of a Nursery

Nursery of young Ash that were casually sown by the Wind, that speedily returned to the owner a very great advantage.

Because this Tree is more generally planted for the sake of the ^{Of the Wal-} Fruit than the Timber, we shall refer it to the Chapter of Fruit-^{nut-tree.} trees, onely let you know that the Timber of the Walnut-tree is of so great use, and benefit, that its incouragement sufficient for the propagation thereof, the fruit then added makes the encouragement the greater.

This Timber is of universal use (unless for outward Edifices) none better for the Joyner, Upholsterer, Gunsmith, Cabbinet-maker, and other Occupations, of a more curious brown colour than the Beech or other Woods, and not so obnoxious to the Worm.

They delight in a light ground or moist gravel, and will grow in ^{Of the Ches-} Clay, Sand, and all mixed Soyls, upon exposed and bleak places, ^{nut-tree.} as more patient of cold than heat.

They are raised from the Nuts, thus: First, spread them to ^{Propagation.} sweat, then cover them in Sand, a month being past plunge them in Water, and reject those that swim; being dried, for thirty daies more, Sand them again, and plunge them as before, keep them in Sand till the beginning of the Spring, and set them in your Nursery, but they thrive best unremoved; you may also set them in *Winter* or *Autumn* in or without their husks, and sow them with other Mast for the raising of Coppices.

The Chesnut-tree growing in Coppices yields incomparable ^{Use.} Poles for the Garden or Hop-yard; If it like the ground it will in ten or twelve years time grow to a kinde of Timber and bear plentiful Fruit. The Timber whereof is (next the Oake) one of the most sought after by the Carpenter, and Joyner, and is of very long lasting, as appears by many Ancient Houses, and Barns built thereof about *Gravesend* in *Kent*.

Being planted in Hedge-rows, or for Avenues to our Country-houses, they are a magnificent and royal Ornament, and although our English men delight not so much in the Fruit of the Chesnut-tree as other Nations, yet will they yield no small advantage to supply our other occasions.

This Tree delights in reasonable good ground, rather inclining ^{The service-} to cold than over hot, for in places that are too dry they never bear ^{tree.} kindly. *Sylva.*

They are raised from the Berries, which being ripe may be ^{Propagation.} sown as other Mast, these will come soon to be Trees, and being planted young thrive exceedingly; the best, and speediest way is to encrease them from Suckers or Sets.

The Timber is useful for the Joyner, and being of a very de-^{Use,} licate Grain, is fit for divers Curiosities; It also yieldeth beams of a considerable bigness for Building.

The shade is beautiful for Walks, and the Fruit not unpleasant.

Sect. 3.

Of several other Trees not so generally made use of for Timber, as for Fewel, Coppice-Woods, Hedge-rows, &c.

- The Birch.* The Birch will grow on any Land, and cannot well be too barren, it will thrive on the hot burning Sand, in the cold wet Clay, Marshes, Bogs, and Stony places, nothing comes amiss to it.
- Propagation.* The Birch is altogether produced of Suckers, which being planted at four or five feet interval, will suddenly rise to Trees; after the first year you may cut them within an inch of the ground, and they will shoot out very strongly.
- Use.* It is useful for the Turner and for some Rustick Utensils; It makes good Fewel, and Charcoal both great and small.
- The Maple.* The Maple affects a sound, and dry mould, growing both in Woods and Hedge-rows.
- Propagation.* It is propagated of the Keys, as the Ash.
- The Hornbeam.* The Timber is excellent for the Turner, and Joyner, for its whiteness, its lightness, and fine diaped knots, &c.
- Propagation.* This Tree chiefly desires to grow in cold hills, and in the barren, and most exposed parts of Woods.
- Use.* The most expeditious way of raising it, is by Sets of about an inch diameter, and cut within half a foot of the Earth; it may also be raised of the seeds sown in *October*, which are ripe in *August*.
- Use.* It is a very hard Wood for the Mill-wright, for Domestique, or Rural Utensils where hardness is required.
- The Quickbeam.* Being planted at half a foot interval in a single row, it makes a stately Hedge or Walk in a Garden or Park, growing tall, and speedy, leaved to the very foot of the stem.
- Propagation and use.* It delights in Mountains, and Woods, and to fix it self in good light ground.
- The Hazel.* The Sets may be planted as the Ash, or the Berries ripe in *October* may be sown; It is a quick growing Coppice-wood, is good for some ordinary uses, and for Fewel.
- Propagation.* This Tree above all effects cold, barren, dry and sandy grounds, also Mountains, and Rocky Soyls produce them; but more prosperously in the fresher bottoms, and sides of hills, and in Hedge-rows.
- Use.* They are best raised from the nut, preserved moist, not mouldy by laying them in their own dry leaves or in sand, and sown about the latter end of *February*; They are also propagated of Sets, and Suckers, the young wands by no means to be cut the first year, but the spring following, within three or four inches of the ground; greater Sets may be cut within six inches of the Earth the first year.
- Use.* The use of Hazel-poles, and Rods is generally known to the Husbandman, besides for Fewel, and Charcoal.
- It is the onely Plant for the *Virgula Divina*, for the discovery of *Mines*.

It is a good Ornament for Walks, and yields a pleasant Fruit, but why should we bring this so neer us, when we have as much more excellent Plant at as easie a rate? *viz.* the Filbert.

Sect. 4.

Of Aquaticks or Trees affecting Moist, and Watry places.

The white Poplar delights in moist grounds, and neer the *Mar.* The Poplar. *gins* of Rivers, but not in the Water as the Willow doth.

They are usually encreased by the streight branches or pitchers *Propagation.* set in the ground, but by no means cut off the top until they have stood two or three years, and then head them at eight, ten, or fifteen feet high or more, and they will yield in a few years a very considerable shroud, which shrouds or branches may also be transplanted; you may also let them grow upright without topping them, they are then more Ornamental, but not so beneficial.

Its white Wood is of singular use for the Turner, and also for *Use.* several Rustick Utensils, and for the Gardiner, It makes also Fuel for the fire.

This Tree little differs from the Poplar onely it will grow, not *The Aspen.* onely in moist but in dry grounds in Coppices, &c. is propagated by Suckers, but cut not off the tops of the young Cions the first year; its use the same with the Poplar.

The Abele-tree is a finer kinde of white Poplar, and is best *The Abele.* propagated of slips from the roots, they will likewise grow of layers and cuttings.

In three years they will come to an incredible altitude, in twelve years be as big as your middle, and in eighteen or twenty arrive to full perfection. *Sylva.*

This Plant of all other is the most faithful lover of Watery and *The Alder.* boggy places.

They are propagated of *Trunchions*, and will come of seeds, but *Propagation.* best of roots being set as big as the small of ones leg, and in length about two foot, if you Plant smaller sets cut them not till they stood several years.

The greater Alders are good for uses under the Water, where *Use.* it will harden like a very stone, but rots immediately where it is sometimes wet, and sometimes dry: the Wood is fit for the Turner, and several Mechanick uses; the Poles, and also the Bark are very useful.

The Withy is a large Tree, and fit to be planted on high banks, *The withy.* because they extend their Roots deeper than either Sathies or Willows.

Sallies grow much faster if they are planted within the reach of *The Sally.* the Water, or in a very moorish ground, and are an extraordinary Improvement.

They are smaller than the Sallies, and shorter lived, and require constant moisture. *Officers.*

The common Willow delights in *Meads*, and Ditch sides, not *Willow.* over wet.

They may all be planted by Pitchers, as the *Poplar*; those Sets or Pitchers are to be preferred that grow neereſt to the ſtock, they ſhould be planted in the firſt fair weather in *February*, and ſo till they bud: the *Oſiers* may alſo be planted of ſlips of two or three years growth, a foot deep, and half a yard in length, in Moorish ground, &c. The *Willow* may be planted of ſtokes as big as ones leg, and five or ſix foot long.

Use and bene-
fit.

These *Aquatick Trees* yield a clean white Wood, fit for many uſes, like unto the *Poplar*, they alſo yield Poles, Binders, &c. for the Gardners uſe: the *Oſier* is of great uſe to the Basketmaker, Gardiner, Fiſherman, &c. They are all good Fewel, and make good Charcoal, they are a very great Improvement to Moorish, and wet Lands, an Acre at eleven or twelve years growth may yield you neer an hundred load of Wood; no Tree more profitable than ſome of theſe *Aquaticks* (according to the nature of the place) to be planted upon the edges of Rivers, and on Banks, Bounds, or borders of Meads or wet Lands, they yield a conſiderable head, and ready for ſhrouding in a few years, *Mr. Evelyn* relates that a Gentleman lopped no leſs than two thouſand yearly, all of his own planting.

Sect 5.

Of other Trees uſually planted for Ornament, or adorning Gardens, Avenues, Parks, and other places adjoining to your Maſſion-houſe, and convertible alſo to ſeveral uſes.

The *Sycamor*.

This Tree delights in a good light Garden mould, and will alſo thrive in any indifferent Land, but rather in moiſt than dry; Its propagated of the Keyes, which being ſown when they are ripe, and falling from the Trees, come up plentifully the next Spring, and is a Tree of ſpeedy growth; Sets alſo cut from the Tree will grow ſet in moiſt ground or watred well in the Summer, they afford a curious, ſad, and pleaſant ſhadow, yield a good Fewel, and the Timber fit for ſeveral Mechanick uſes.

Its propagation
and uſe.

The *Lime-tree*.

Propagation.

The *Lime-tree* delights in a good rich garden Soyl, and thrives not in a dry hungry cold Land; It is raiſed from Suckers as the Elm, or from Seeds, or Berries which in the *Autumn* drop from the Trees.

Uſe.

Style.

This Tree is of all other, the moſt proper and beautiful for Walks, as producing an upright *Body*, ſmooth and even *Bark*, ample *Leaf*, ſweet *Bloſſom*, and a goodly ſhade at the diſtance of eighteen or twenty foot, their heads topped at about ſix or eight foot high, but if they are ſuffered to mount without check, they become a very ſtreight and tall Tree in a little time, eſpecially if they grow near together, they afford a very pleaſant dark ſhade, & perfume the Aire in the months of *June* and *July* with their fragrant bloſſom, & entertain a mellifluous Army of Bees, from the top of morning, till the cool and dark evening compels their return. No Tree more uniform both in its height and ſpreading breadth.

I have known excellent Ladders made of *Lime-tree* poles of a
very

very great length, the Wood may also serve for several Mechanick uses, like unto the other soft and Aquatick Woods.

This most excellent Tree delights in a rich garden mould or other light mould not too dry, and is easily propagated by Layers: The Horse Chestnut-tree. Its a quick growing Tree, most pleasant to the eye at the spring, when its clammy Turpentine buds break forth into curious divided hanging Leaves; it bears a most glorious Flower, and prospers well in our cold Country, and therefore worthy to be taken into our most pleasant Gardens, Avenues, Parks, and other places of delight, and pleasure. Its Propagation and use.

They delight in cold, high, and rocky Mountaines, where they naturally grow in great abundance, yet will they grow in better and warmer, but not in over rich and pinguid; if you plant them you must be careful at first to preserve them moist, therefore Land over hot, Sandy, or Gravelly, is not so good. The Fir, Pine, Pinafter, and Pitch-tree.

They are all raised of the Kernels taken out of the Clogs, being laid in Water some dayes, and then exposed to some gentle warmth of the fire, will open that you get the Seeds out with much facility, which may be sown in your Nursery, or rather where you intend they should grow, especially the Pine which will hardly bear a remove unless very young, the Firs will very easily, and may also be propagated of slips, as I have been credibly informed. Propagation.

The Fir grows tall, streight, and neatly tapering, therefore more uniform for Walks, &c. but the Pinafter bears the proudest, and bravest branches, with a fairer and more beautiful Leaf, these two excel the rest for any Ornamental use, and are sooner mounted, growing in a few years to a very great height, Mr. Evelyn gives you the relation of one that shot no less than sixty foot in height in little more than twenty years: I have seen presidents of the like nature, for the first half dozen years they make no considerable advance, but afterwards it comes away miraculously. Sylva.

The uses of this Timber are so well known to our Ship-wrights, Carpenters, and other Mechanicks inhabiting neer the Maritime coasts, that nothing here need be said. The Larch, Plane, and Locust.

Out of these Trees are made Turpentine, Rosin, Tar, and Pitch.

These Trees are not much in use, yet deserve to be propagated for their rarity, excellent shade, and durable Timber.

This curious Tree delights in a warm, and dry Land, not so much desiring a rich as a warm place. The Cypress.

Is propagated from the Seed sown in March, and easily abides transplantation. Propagation and use.

It is one of the most Ornamental Plants nature affords, and may either stand single, Pyramid-like, or set in Hedges and clipped to any form you please; we have so little of its Timber here, that we onely refer you to the Joyner, and Cabinet-maker for its use.

This Tree grows in all extreams, in the moist Barbados, the hot Bermudas, the cold New-England, in the Bogs of America, in the Mountains of Asia. Cedar. Sylva.

It is propagated of the Seeds, is a beautiful Tree; Its Timber incomparable, and almost perpetual.

The Alesternus. The Alaternus thrives very well in *England*, as if it were natural, is raised from Seeds, is swift of growth, and one of the most beautiful and useful of Hedges and Verdures in the world, and yields an early honey-breathing Blossom.

The Phillyrea. This Tree delights in a warm fertile Soil, and is propagated of the Berries or Seeds sown in the Spring, and also of the slips set like the slips of Box.

It is a most beautiful Plant, and one of the quickest growth of any, for the raising of *Espatier* Hedges, and covering of *Arbors*, being always of incomparable Verdures.

The Bay-tree. This Tree greatly loves the shade, yet thrives best in our hottest Gravel.

They are raised of their Suckers, and their Seeds gathered when they are through ripe, in the midst of Winter, and sown in *March*.

The beauty, and use of this Tree is commonly known.

The Laurel. This Tree preserves its Verdures best in the shade, but grows anywhere, is propagated like the Bay, and is one of the most proper, and Ornamental Trees for Walks and Avenues, of any growing.

The Eugh-tree. It grows generally in the barrenest grounds, and coldest of our Mountains, is easily produced of the seeds, washed and cleansed from their Mucilage, and buried in the ground like Hawes, it will be the second year are they peep, and then they rise with their caps on their heads; at three years old you may transplant them; they are also propagated by Plants or Suckers, but they are difficult of growth.

The Timber is a very hard wood, and very useful to most Mechanicks that work in Wood; they are also a beautiful Ornament, and a sure defence against impetuous Winds, and nipping Cold.

Privet. Privet is a Plant that hath been in great request for adorning Walks, and Arbors, till of late other new, and more acceptable Plants by degrees begin to extirpate it out of the most modish Plantations, nevertheless it may yet claim a corner in ours.

Sect. 6.

Of Shrubs, and other Trees less useful, yet planted for Ornament, and delight.

Mytil. This Tree requires a Winter shelter, is raised usually by slips, and layers, but may be raised of Seeds; its a very sweet and pleasant Plant.

Box. The Box is a Plant that hath been much more in use than now it is in the Garden, from whence most banish it by reason of its injurious scent, it deserves to be planted in the more remote parts; it will grow in any indifferent Land, and is encreased by slips, the Tree is a very curious Ornament, and may be reduced to diversity of shapes and formes, and yields a most excellent Wood, than which none is more desired by our Mechanicks.

This

This Tree is highly commended by Mr. Evelyn in his *Sylva*, for a *Juniper*. Tree that may be formed into most beautiful, and useful Hedges, and that one onely Tree covered an *Arbor* capable for three to sit in, seven foot square, and eleven in height, yet continually kept thorn, having been planted there hardly ten years. They are raised of their Berries, which come up in two months.

This Tree groweth tall and great, is increased by Suckers, and Layers, and is usually planted by those who respect variety and pleasure; the Wood also is medicinal. *Tamarisk*.

Is usually propagated for its pleasant green leaf, though the *Arbor Vita*. cold Winter makes it dark, and brown; it is usually planted by slips and layers.

There are several Trees that are planted on the edges of Walks, and in spare places in our Rural Gardens, and Orchards, onely for their Ornamental habits they usually wear in the Spring, and Summer, as *Arbor Jude*, *Laburnum*, the *Sena-tree*, *Spanish-broom*, the *Bladder-nut*, the *Gelder-rose*, the *Pipe-tree*, *Palurus*, *Jesumies*, *Wood-binds*, *Virgins-bower*, the *Strawberry-tree*, *Mezereon*, *Laurus-tinus*, double-flowred *Pomegranats*, *Apples*, *Pears*, *Cherries*, *Peaches*, &c. *Roses of all sorts*, and several other Trees yielding great variety, pleasure, and content to the Laborious Husbandman: For the nature, ordering, and propagating, and uses of them, and all other pleasant Plants, Flowers, and Hearbs, I must refer you to those Tracts that peculiarly handle that subject, our intentions being onely to promote the Propagation, and encourage the Industrious in their advancing of such Trees, Plants, Grains, &c. that are necessary, and profitable to our Country-farmer, although we have a little in this place digressed from our former purpose: But we return and give you an account

Seet. 7.

Of such Trees that are necessary and proper for Fencing, and Enclosing of Lands, Orchards, Gardens, &c. And the best way of Raising such Fences.

Seeing that Fencing, and Enclosing of Land is most evident to be a piece of the highest Improvement of Lands, and that all our Plantations of Woods, Fruits, and other Tillage, are thereby secured from external Injuries, which otherwise would lie open to the Cattel;

*Texinda sepes etiam, & pecus omne tenendum est,
Præcipue dum frons tenera, &c. Virgil.*

And also subject to the lusts of vile persons, as old *Tusser* observed where Fences and Enclosures were deficient.

*What Orchard unrobbed escapes?
Or Pullet dare walk in their Jet?
But homeward or outward (like Apes)
they count it their own they can get.*

For which reason we are obliged to maintain a good Fence, if we expect an answerable success to our Labors. We shall therefore enquire out the most proper Trees for that purpose : And first, the *White-thorn* is the best for fencing, it is raised either of Seeds or Plants; by Plants is the speediest way, but by Seeds where the place wil admit of delay, is less charge, & as successful, though it require longer time, they being till the Spring come twelvemonth ere they spring out of the Earth, but when they have past two or three years they flourish to admiration.

The Holly.

Next unto the *White-thorn*, is the *Holly*, which claims a preference much before the *White-thorn*, were it not for its slow growth, in its puberty, which may the better be born withal, if we consider the excellency thereof, either for sight, ornament, or defence, for thicknes, and closeness, it may compare to a Wall or Pale to defend your inclosure from Winds, or the eyes of ill neighbours, and for its strength against man or beast its impregnable, for height or thicknes it will answer your desires.

It is raised of the Berries or the Sets, as is the *White-thorn*, but the Sets are more difficult of growth, unless they are planted late in the Spring, and well watered.

Prickly amb.

This Plant deserves a principal place amongst our Trees for Fences, it yielding a very strong, and firm prickly branch, and ever green-leaves, is quick of growth, and easie of propagation, it is raised either of the bright Coralline berries, which hang most part of the Winter on the Trees, and lie as long in the ground ere they spring, as the *Haw-thorn* berries, or else it is raised of Suckers, or slips.

Black thorn.

The *Black-thorn* (and *Crab* also) yields a very good Fencing branch, and is raised as the *White-thorn*.

The Elder.

A considerable Fence may be made of *Elder*, set of reasonable lusty truncheons like the *Willow*, and may be laid with great curiosity; this makes a speedy shelter for a Garden from Winds, Beasts; or such like injuries, rather than from *rude Michers*.

Furzes, &c.

Furzes, *Brambles*, &c. are very necessary for the planting of dry banks, where it is difficult to raise a better Fence, and in those places they will maintain the Bank against any Cattel; *Furzes* are also sown on barren Land, and esteemed a considerable Improvement, the green tops are good food for Horses, the prickles thereof being taken away by chopping.

The speediest and best way of planting a Quickset hedge.

Let your Plants be about the bigness of your thumb, if you can, and set almost perpendicular, and cut within four or five inches of the ground, and planted in a double row at about half a foot distance, they will prosper infinitely, and much outstrip the closest ranges of our trifling Sets.

Another way more usual and better for the Field.

The other way most followed for the planting of a quick Hedge, is one the banck of a ditch thus: Place the first row of sets on the brink of the ditch in the upper mould, and cover them with the better part of the mould taken out of the ditch, and raise the banck about eight or ten inches above them, then place another row of Sets, each Set against the spaces of the first row; Then

Then lay more of the best mould to the roots of the Sets, and raise the bank as before, and place another row of Sets opposite to the first, applying the best mould to the Roots, and finish the Bank with the bottom of the Ditch.

You may plant it as the White-thorn, but if you think that too tedious to wait its rise, you may Plant it with the White-thorn, and let every fift or sixt be an *Holly-set*, they will grow infallibly with the Quick, and as they begin to spread, make way for them by extirpating the *White-thorn*, till they quite domineer.

*Of planting the
Holly-hedge.
Sylva.*

Also you may lay along well rooted Sets a yard or more in length, and stripping of the leaves and branches, cover them with a competent depth of Earth, and they will send forth innumerable Suckers, which will suddenly advance into an Hedge.

All these Hedges being young should be carefully Fenced with a dry Hedge from the biting of Cattel on both sides, if need require, untill the tops are out of their reach, and where any fail, to supply them in time with new, or to plash the next to fill such vacant gaps.

*Preserving of
Hedges from
Cattel.*

Whilest they are yet young, they are to be constantly weeded, least the Weeds prevent the thick spreading of the Hedge at the bottom, as well as check the growth and prosperity of the Plant.

*weeding of
Hedges.*

If your Hedge stand remote, or that you do not Annually keep it clipt whereby it should thicken, then at about six years age you may plash it, about *February* or *October*; some workmen are far more expert and judicious at this, than others are, and can better do it than any pen can direct, therefore I shall not trouble you therewith, but leave you to the skill of the workman.

*Plashing of
Hedges.*

Sect. 8.

Of the Nursery for the more convenient propagation of most of the fore-mentioned Trees.

Several of the said Trees are usually produced of the Seed, *Trees produced of Seeds, &c.* *Must, or Berries*, and those are the *Oake, Beech, Chesnut, Service, Maple, Sycomore, Horn-beam, Quick-beam, Hasel, Firs, Pines, Pinafter, Pitch-tree, Cypress, Cedar, Bayes, Laurel, Privet, and Juniper*, which being sown spring the first year; and the *Ash, Phillyrea, Engb-tree, White-thorn, Black-thorn, Holly, and Pyracantha*, whose Seeds, or Berries usually lie in the Earth another year after they are sown, ere they spring.

To produce Seeds immediately of the Seed is the better way: first, because they take soonest: secondly, because they make the straightest, and most uniform shoot, being very considerable in Timber-trees: thirdly, because they will neither require staking, nor watering, which are two very considerable Articles: and lastly, for that all transplanting (though it much improve Fruit-trees) is a considerable impediment to the growth of *Forrest-trees*, but if they are removed out of the *Nursery* whilest they are young, and carefully preserved, this injury is not so great; also Plants raised of the Seed in the place where they are to stand, shall

*Best raised of
Seed.*

Sylva.

shall

shall soon outstrip a removed Plant of a greater age, especially the *Pine* and *Walnut*, where the *Nut* set into the ground shall certainly overtake a Tree of ten years growth, which was planted at the same instant.

Preserving
and preparation
of the
Seeds.

Because of the coldness of the Winter, and the damage the *Mast*, *Seeds*, or *Berries*, may receive from *Mice*, and other *Vermine*, it is not good to sow them till the spring, for the better preserving of them from drying, rotting, or decaying; you may put them into Pots, Barrels, or other Vessels, Cellars, Sheds, or such like places, with a mixture of *Earth*, or *Sand*, not too dry, intermixed *stratum super stratum*, with the Seeds, &c. At the spring you will find them sprouted, and being committed to the Earth, as apt to take as if they had been sown with the most early.

Some affirm that by this way of preparing the Seed, &c. those Seeds that otherwise would have lain over another Winter in the ground before they had sprung, being now committed to the ground before the full in *March*; will that season be chitting, and speedily take root. *Sylva.*

Election of the
seed.

Chuse not your *Mast*, or *Seeds*, from the aged, decaying, or not thriving Trees, but from a thriving Tree, of a sound stock, and firm Wood, and let the Seed be the most weighty, clean, and bright.

Place for a
Nursery.

Make choice of some spare place of ground well Fenced, and secured from Cattel, Conies, &c. respecting the *South East* rather than the full *South*, and well protected from the *North* and *West*, let the ground be rather dry than moist, for Trees will rarely thrive being removed out of a wet into a dry place, but exceeding well out of a dry into a moist; break up the ground, and prepare it the Winter before you sow it, the cleaner it is from Weeds, and the lighter and mellow the ground is, the better will the Seeds thrive, for in much weeding the young Plants are endangered.

The Nursery for your *Firs*, *Pines*, *Cypresses*, and all such *Winter-greens*, and tender Plants, had need be sheltered from the *Southern Aspects* either artificially, or else made where it is naturally so defended.

Manner of
sowing.

You may make Furrows, or Trenches of four or five inches deep, at about two foot breadth with a convenient Interval for the more commodious Weeding, and dressing the Plants: Into these Furrows cast your Seed, or *Mast*, such as usually spring the first year, in beds by themselves, and such that stay the second, by themselves, or (as it is best for the better ordering them at their removal) sow each Seed or *Mast* apart, then cover them with a Rake.

The Seeds of *Firs*, *Pines*, &c. need not be sown above an inch deep, and covered finely with a Sieve, and duly watered.

If the Seeds of *Pines*, or *Firs*, be rolled in a fine Compost made of *Sheeps-dung* and planted, they never fail.

But for the more convenient removal of the *Pine* (which least abides it of any Tree I know) take small earthen Pots without bot-

bottoms, or small *Baskets, Boxes*, or such like, & set them to the brims in rows in the ground, and fill them with good mould, and plant in each of them two or three Seeds; when they grow, leave one only one, and by this means at two or three years growth may you securely remove them, the Earth being kept fast about the Roots, and wherever you plant them the Tree it self in time will rid its stem of the Pot or Box.

When the young Imps or Seedlings are sprung up, you must be very careful in keeping them from Weeds, which else will soon over-run them, and after weeding the ground being unsettled, give them a little water if it be a dry and hot season. *Ordering of the Nursery*

The Winter following you may lay a few Bushes, Furze, or such like over them, and scatter a little Straw onely to break the force of the Winds which in the Winter season injure more than Snow or Frost.

But for the *Cypress, Phillyrea*, and such other tender Winter-greens, you must defend them with more care.

If you intend to raise a *Coppice* from *Mast*, or *Seed*, dig or plough the parcel of ground you intend for a *Coppice*, as you would prepare it for *Corn*, and with the *Corn* either in the *Autumn* or *Spring*, sow also good store of such *Mast, Nuts, Seeds, Berries, &c.* as you desire; then take off your Crop of *Corn*, and lay it up for Wood; although that several sorts of your Seeds come up the first, yet will they receive but little injury by treading at the Harvest, but injure it as little as you can; also the stubble being left high, will be a shelter for the young Trees the first Winter. *Sowing of a Coppice.*

Sect. 9.

Of the Transplantation of Trees.

The onely time for removing or transplanting of all Trees that shed their leaf, is in *October*, or the beginning of *November*, immediately after, or at the fall of their leaf; But that time being omitted you may transplant them till the Spring in open weather, and before they bud. *The time.*

All Trees that shed not their leaf Annually, but are ever green, are to be removed in the Spring when the cold is over, for they spring not so soon in the year as the other: But some affirm the onely time to be in *August*.

Such Trees that are *pithy*, as the *Ash, Sycomore, Lime-tree, Aspen*, and such like, cut not off their tops the first year of their remove, because the wet will be apt to perish the Plant, neither diminish the heads, nor many of the branches, nor Roots of the *Firs, Pines*, or other *Resinaceous* Trees, for they are prone to spend their Gum, to the great Injury, if not ruine of the Plant. *cut not the tops of some Trees.*

The same time and Method is to be observed in the transplantation, removal, or propagation of the Suckers, Cions, Slips, or Layers of the *Elm, Birch, Lime-tree, Horse-chestnut*, and such other Trees that are usually produced of Suckers, Layers, Slips, &c. *Of such Trees that come of Slips, Suckers.*

as you do in the removal of the young Seedlings of the other Trees.

Time to slip or lay.

Onely that for the slipping or laying of such Branches of Trees that had not before taken any Root, the most proper time is in the top of the Spring, about the time that the Sap is newly risen, and the Tree ready to bud.

The time for Aquaticks.

All Trees that are raised of *Fitchers*, or *Sets*, as the *Poplar*, *Aspen*, *Abel*, *Alder*, *Withy*, *Salley*, *Osier*, *Willow*, *Elder*, and *Privet*, are to be planted in *February* or *March* before they are too forward.

Manner of transplanting.

Let your young Plants be removed rather into a better mould (though there is but a little about the Roots) than a worse, let as much Earth adhere to the Roots as you may, and leave as much of the Root on as you can, abating onely the *top* or *down-right* Roots, and spread the other Roots every way in the pits or holes made for that purpose, which ought to be made larger and deeper than the Plant at present requires, and filled up with loose mould, that young Roots may the better spread to seek nourishment for the Tree.

Plant shallow.

It is good to plant it as shallow as might be, and (not below the better part of the Earth) into the *Gravel*, *Clay*, *Sand*, nor *Water*, &c. but rather advance the Earth about the Tree than set the Tree too deep; Be sure also not to set it deeper than it stood before.

Observe the coast.

In the removal of such Trees that have arrived to any considerable bigness, it is very expedient to observe the *coast*, and side of the stock which way it stood before its removal, and not to be esteemed such a trifle as *Lawson*, and many other trifling *Authors* pretend; For it is most evident that the Sap doth naturally flow most on that side of the Tree that's next the Sun, and on that side doth the Tree more encrease than on the other, as is evident in observing the Pith to be neerer the *North* than *South* side of the Tree: But in such Trees that stand thick in a Nursery, or have long stood in the shade, where the *Sun* hath wrought little or nothing upon them, you may be less critical.

The distance.

The *Oake*, *Pine*, and *Walnut-trees*, bear spreading large branches, and require greater distances than any other, therefore the neereft should stand forty foot.

The *Beech*, *Ash*, *Eugh*, *Fir*, *Chestnut*, &c. may stand somewhat neerer than the other.

The *Elm*, and the *Horn-beam* will grow the neereft of any Trees; For the other you may plant them at what distance the magnitude of the Tree, your occasions, or the nature of it requires.

Waring of Trees.

The Waring of your Trees immediately upon their transplantation, very much conduceth to their prosperity, and settling the Earth about the Roots, unless in weather extream cold, the Plant being of a tender kinde; Also the young Plants for the first year will require your aid in waring of them.

Also if Trees have been carried far, the setting of the Roots in Water some certain time before you inter them, conduces much to their revival and prosperity.

If

If the Trees be of any considerable height, they ought to be carefully defended, as well from the injurious Winds, as the trifications of Beasts, by staking them, and with a wisp of Hay or other soft *Ligament*, to binde them to such stake, not omitting to interpose a little Moss, or Hay, &c. between the Tree and stake, to preserve it from galling; If your Trees be in danger of Cattels injuries, than you ought to binde or set bushes about them, to prevent their rubbing.

Planters in most places do strictly observe to cut the foot or ground end of *Poplar*, *Withy*, or other *Aquatick Pitchers*, or *Sets* Planting of Aquaticks. only one way, like a Hindes foot, pretending that to be a principal observation.

If either your impatient fancy, or your urgent occasions oblige you to the removal, or transplantation of Trees in the Summer, you may tread in the steps of a certain *Prince Elector* that at *Hidelbourg* in the midst of Summer removed very great *Lime-trees* out of one of his *Forrests*, to a steep hill exceedingly exposed to the heat of the Sun, the Heads being cut off, and the Pits into which they were transplanted, filled with a Composition of earth, and *Cow-dung*, which was exceedingly beaten, and so *diluted* with Water, as it became almost a Liquid *Pap*, wherein he plunged the Roots, covering the Surface with the Turf; It is presumed that if the Trees were smaller, be they of what Wood soever, there needeth not to absolute a decapitation.

Several relations there are of Trees that have been planted, or removed of eighty years growth, and fifty foot high to the neereft bough, wafted upon *Floats*, and *Engines* four long miles, with admirable success, and of Oaks planted as big as twelve Oxen could draw, to which effect these are prescribed as the ways to accomplish the like designs.

Chuse a Tree as big as your *Thigh*, remove the Earth from about him, cut through all the *Collateral* Roots, till with a competent strength you can inforce him upon one side, so as to come with your Ax at the *Top Root*; cut that off, redress your Tree, and so let it stand covered about with the mould you loosened from it, till the next year, or longer, if you think good, than take it up at a fit season.

Or a little before the hardest Frost surprise you, make a square Trench about your Tree, at such distance from the stem as you judge sufficient for the Root, dig this of competent depth so as almost quite to undermine it, by placing blocks, and quarters of Wood to sustain the Earth; this done, cast on it as much Water as may sufficiently wet it, unless the ground were moist before, thus let it stand, till some very hard Frost do bind it firmly to the Roots, and then convey it to the pit prepared for its new station.

But if it be over ponderous, you may raise it with a Pully between a *Triangle*, placing the Cords under the Roots of the Tree, set it on a *Trundle* or *Sled* to be conveyed, and replanted where you please; by these means you may transplant Trees of a large

stature, and many times without topping or diminution of the head, which is of great importance to supply a *defect*, or remove a *Curiosity*.

Helps to Trees. After you have transplanted your Trees, if you lay about the Roots or Stems, *Fern, Straw, Stubble, Hayme*, or any other Vegetable whatsoever, either green or half rotten is best, which will preserve the Roots moist in the Summer, and yield a good Manure, or Soyl, which the Rain will carry to the Roots.

Also stones laid about the Roots of Trees preserves them moist in the Summer, and warm in the Winter, and keeps them fast against the shaking Winds.

Planting of Coppices.

Coppices may also be planted about *Autumn* with the young Sets or Plants, the best way is in rows about ten or fifteen foot distance, for then may you reap the benefit of the *Intervals*, by Ploughing, or Digging, and Sowing, till the Trees are well advanced; Carts also may the better pass between at the time of felling without injury to the *Stems*, or danger of the Cattel; There will also be many pleasant Walks, and yet an equal burthen of Wood at the full growth of the Coppice, as though they were thick, and confusedly planted.

Thickning of Coppices.

There is a compendious way for thickning of Coppices that are too thin, by laying of some of the Branches of the Trees (that stand neereſt unto the bare places) on the ground, or a little in the ground, giving it a chop neer the foot the better to make it yield, this detained with a hook or too, and covered with some fresh mould at a competent depth, will produce a world of Suckers, and thicken, and furnish a Coppice speedily.

Sect. 10.

Of the Pruning, Shrouding, Cutting, and Felling of Trees, and Coppices.

Pruning of Trees.

In the discreet performance of this work, the Improvement of our Timber and Woods, doth much consist, and renders our Avenues, Walks, Parks, &c. much more pleasant, and commodious to have the Trees stand in order, their Branches at a convenient height, and kept clean from all superfluities.

Such Trees that are for Timber, its best to prune whileſt they are young, and the Branches not too big; of these and other Trees its good to cut off the Branches that are superfluous, about *January*, with a very sharp bill or other tool, making the stroke upward by reason of the grain of the Wood, and to prevent the ſlitting of the Tree at the fall of the Branch, and cut it clean, smooth, and close, for by cutting of the Branches at a distance from the Tree, the stumps rot, and leave hollow holes which decayes the Tree, and spoiles the Timber.

Shrouding or lopping of Trees.

Such Trees that are not fit for Timber, or that you desire should yield you a present advantage, or serve for Fewel, you may throud or lop them, which will return you a considerable advantage, and is much to be preferred before a Coppice in these several

ral respects, 1. These Pollard or Shrouded Trees need no Fence to be maintained about them, standing in no danger of the brou-
sings, or frications of Cattel, Conies, &c. 2. You have the be-
nefit of Grazing under these Trees, which is very considerable
whilest the tops are young, 3. The stockes taken in time before
they decay or grow hollow, yield a good Timber fit for many
uses, or at least good cleft for the Fire. 4. And lastly, you
may raise these Pollards in Hedge-rows, and spare places, and bor-
ders of your grounds where they prove a good shelter as before
we noted, and little injure the ground.

Notwithstanding the Coppice is quicker of growth, and raises
a more considerable advantage for the present than this way, in
some places therefore where you have conveniences for a Coppice
I leave you to your election.

Trees are not to be Shrouded till they have taken fast Rooting, ^{Times for}
and so stood for three or four years, at what height you think ^{shrouding.}
convenient, so it be out of the reach of Cattel, either at the be-
ginning of the Spring, or the end of the Fall; for the harder
sorts of Woods it is very indifferent, observing that they be not
lopped above once in ten or twelve years, and at any time in the
Winter: The Elm, and the Ash, and such like pithy, and softer
Woods, are fittest to be Shrouded at the Spring, lest the Winter
injure the Tree.

Always observing to cut the remaining stumps aslope, and ^{Observations}
smooth, that they cast the Water off, that it perisheth not the ^{in shrouding.}
Tree.

Take not off the head of the Poplar, nor of any of the soft
Woods (before unshrouded) growing upright, and smooth after
they have attained the bigness of ones leg, unless you leave some
Collateral shoots to Attract the Sap; for it will endanger the
Tree.

All *Perennial Greens*, or Resinous Plants are not to be pruned ^{Pruning of}
or cut until the greater Frosts, and bitter Winds are past, and ^{winter-greens.}
then not in any wise decapitate the Fir, Pine, nor such pithy
Plants, and be very sparing of their Collateral Branches.

You may cut Aquatick-trees every third or fourth year, and ^{Cutting of A-}
some more frequently according as the Tree is in proof, or the ^{quaticks.}
shrouds or tops fit for your occasions; cut them not too neer the
main stock, because of perishing the Tree, and besides it gives
leave for the new sprouts.

The best time for cutting Aquaticks, either to dress or plant ^{The time.}
them, is about the beginning of *March*, or the first open weather
at the Spring; but if for the Fire, in the Winter before the Sap be-
gins to rise, or you may cut them at any time between leaf and
leaf.

Such *Coppices* or *Coppice-trees* that you have lately planted, at ^{Cutting of}
one, two, or rather three years growth, may be cut within two or ^{young Cop-}
three inches of the ground, in the Spring time (the less prospe- ^{pices.}
rious especially) which the new Cions will suddenly repair in
clusters, and tufts of fair poles.

Felling of Coppices

Coppices being of a competent growth, as of twelve or fifteen years, are esteemed fit for the Ax: but those of twenty years standing are better, and far advance the price: seventeen years growth affords a tollerable Fell, you are to spare as many likely Trees for Timber, as with discretion you can.

Time.

Coppices may be felled or cut from mid *September* to mid *March*, and to be avoided by mid *May* at the farthest, else much injury may be done by Teams in bruising the young Cions, and injuring them with their feet, also the removing of the *Rough* or *Brush*, breaks off many a tender Sprig.

Manner.

Cut not above half a foot from the ground, and that slope-wise, trimming up such as you spare for standards, as you go from their extravagant Branches, Water-boughs, &c. that hinder the growth of others.

After the Felling, and removing of the Wood, shut up all the Gaps about the Coppice, having raised a sufficient Hedge about the same before the Spring, and so keep it Fenced, and defended from Cattel, till it be above the reach of Cattel, then about *July* may you put in your Beasts to spend the Herbage in such well grown Coppices.

Felling of Timber Trees.

When your Timber Trees are Arrived to their perfect age, full growth, or best state, or that you are necessitated to take them away, then consider which way, and what time is best for your advantage to fell them.

Time.

The time of the year is to be considered of according to the occasions, or uses you have for your Timber; if it be sale, that your present advantage onely you seek, then the best time is from mid *April* to Mid-summer the Sap being then proud, and the bark easie to be taken off, which will yield you a considerable price.

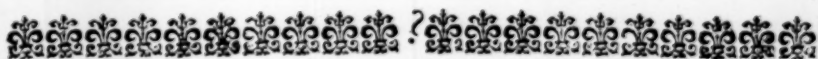
But if you desire your Timber for your own proper occasions, fell it in *December* or *January*, when the Tree is cleere of Sap, by which means the Timber will not be so much subject to the Worm, neither will it *cast*, *rist*, or *twine*, as it will if cut in the Summer; It will also last longer in any Buildings, and not be so apt to yield under a Burden, for the great plenty of Sap mollifies the Timber, and makes it rot and decay, therefore the cutting of Trees at Barking time, doth very much injure our Timber, debilitates our Edifices, and expedit their approaching decay.

Fell not in the increase nor full of the Moon, nor in Windy weather, at least in great Winds, lest it throw the Tree before you are willing: I have seen a good Tree much injured by falling too soon.

Manner of felling great Trees.

For the Felling of the greater sort of Timber Trees, one of the first, and most principal things is, the skilful disbranching of the Boal of all such Arms, and Limbs as may endanger it in the fall; for many excellent Trees have been utterly spoiled for want only of this consideration; In the greater Arms chop a nick under it close to the Boal, and meet it with the down-right stroak, it will be cut without splitting.

If you reserve the Roots in the Earth in expectation of a new encrease of Suckers, then Fell the Tree as neer the Earth as you can, for that is the best Timber; But if you intend a total extirpation, then grub the Tree which is more for your advantage, some advise to Bark the Trees as they stand, and the next season to Fell them, which I take to be worthy of your practise.



CHAP. VII.

Of Fruit-Trees.

Sect. 1.

Of the Profits and Pleasures of Fruit-Trees.

THe planting of Fruit-trees is undoubtedly one of the greatest Improvements that can be made of the most parts of our English Land, as all who have written of Improvements do agree, and *Worcester-shire, Hereford-shire, Gloucester-shire, Kent*, and many other particular places in this Land can sufficiently evidence the truth thereof.

1. Because it is more universal than many other sorts of Improvements, there being but little ground in *England*, but one sort of Fruit or another will prosper upon it, if judicially prosecuted.

2. The use of Fruits both for meat and drink is such, that there cannot be too great a stock, especially of Cider Fruits.

Mr. *Hartlib* in his *Legacy* tells you of the benefits of Orchard-fruits, that they afford curious Walks for pleasure, food for Cattel in the Spring, Summer, and Winter (meaning under their shadow) Fuel for the fire, shade from the heat, Physick for the sick, refreshment for the sound, plenty of food for man, and that not of the worst, and drink also of the best, and all this without much labor, care, or cost.

The high Applauses, Dignities, Advantages, and variety of Pleasures and Contents, in the planting and enjoyment of Fruit-trees, M. *Ralph Austen* hath very copiously, and particularly set forth in his *Treatise of Fruit-trees*, to which for brevity sake I refer you, and shall onely in this place give you a Catalogue of such Fruit-trees as are for our advantage, with their several ways of propagating, and ordering of them. And first of Standard-trees.

Amongst which the Apple worthily deserves the preheminence, both for its universality of place, scarce a Country-parish in *England*, but in some part or other it will thrive; and also for

its use, being both Meat and Drink, and generally esteemed by the most curious, as a pleasant Dish. It also exceeds all other English Fruits for the time we enjoy them, not a day in the year but they may be had, and not of the worst. There is a very great diversity of the species of them; Mr. *Hartlib* speaks of one who had about two hundred sorts or species, & does verily believe there are neer five hundred in this Island: The French Gardiner reckons up eighty seven several sorts of choice kinds of them in that Country, I presume he computes not the common.

Apples.

They are of different natures, some are early ripe, some later, some are but for a time, others are long preserved; I have heard of Pippins that have been kept two or three years sound, onely by care in gathering of them, and at the right season kept in a Room free from the common Annoyances of heat, and cold, and hung by the tayls; some are preserved for the Table, others for Cider; the best for the Table are the Jennings, the Harvey Apple, the Golden Pippin, Summer and Winter Pearmain, and Pippins, the John Apple, with many others; the best for Cider are the Red streak, the Jenner Moyl, Eleot, stocking Apple, &c.

Profits of Apples.

Apples planted dispersedly about your ground either in the Hedges, or in Rows by the Hedges, raise a very considerable advantage, at a very easie rate or charge, and that onely in nursing them up till they are freed from common injuries; the great advantages accrewing thereby are evident to the Inhabitants of *Hereford-shire*, *Glocester-shire*, and several other places in *England*. I heard it certainly related in *Hereford-shire* of a Tenant that bought the Living he then rented, onely with the benefit he made of the Fruit growing thereon in one year, with this advantage that he utter'd his Cider by retail as they usually do Beer. Orchards planted with Apples arise to a very considerable Improvement. I know (saith Mr. *Hartlib*) that ten or fifteen pound an Acre hath been given for Cherries, more for Pears and Apples, the Land it self whilest these Trees are small, and yield you not your desired gain, is capable of bearing any sort of Tillage till the Trees yield too much shadow, and then if they are not too thick is better than before it was planted, sometimes to a threefold Improvement, and hath the preheminency above other Pastures in being earlier, not subject to scorching heats, and in the Winter there is plenty of food for Sheep, Calves, &c.

Legacy.

2 Of Pears.

Next unto Apples, the Pear challengeth his place; They will prosper in some sorts of Land where Apples will not, as in Stony, Hungry, Gravelly Land, yea in a tough binding hungry Clay, the Root of a Pear-tree being it seems more able to pierce a Stony, and Stiff ground.

The Pear-tree bears almost its weight of Sprightful Winy Liquor, sometimes one Tree bears two, three, or four hogshheads per Annum; In *Hereford-shire* I was credibly informed that neer *Rosse* groweth a Pear-tree of that magnitude, that the circumference of the body or stem of the Tree, was as much as three men from hand to hand could beclip or fathom, and that there was made in one year

year of the Fruit thereof, seven Hogsheds of Perry.

There are supposed to be four or five hundred several kinds of Pears, the French Gardiner reckons about three hundred of choice sorts of Pears.

Several are for the Table, as the Windsor-pear, Burgamets, Boon-christiens, Greenfield-pear, &c. For Perry, the Horse-pear both white and red, the Bosbury-pear, Choak-pear, &c. It is worthy to be taken notice of, that the best Pears for Perry, and so of Apples for Cider, are not edible, crude as they are from the Trees, and may be planted in the Fields or Pastures with less danger of loss than the Table-fruit.

Some of these also are for the Summer onely, and will not last, others will keep over the Winter.

The Advantage of the Pear are equal to those of Apples; for though they are deficient in some cases, yet they recompense it in other; It is the Goodlier-tree in a Grove, to shelter a House, *Sylva.* and Walk from Summers heat, and Winters cold Winds, and far more lasting, and for the quantity of ground it covers, bears much more than the Apple.

Of Cherries there are of several sorts, some of one colour, *3. of Cher.* some of another, some early, and some late, but for the Orchard *vitt.* or Field, the Flanders Cherry excells, the great bearing Cherry also is a very good kinde; for that he seldome fails, though in a cold, and sharp Spring they are late ripe, and hang neer a fortnight after they are red before they be through ripe, they are the fittest sort for the coldest places, they are not so pleasant as the other, by reason of the tartness of the Juice, yet sharp Cherries are more wholesome than the sweet.

The Advantages of a Cherry-orchard are very great, Mr. Hart-*Legacy.* lib gives the relation of a Cherry-orchard about *Sitten-burn* in Kent of thirty Acres, that produced in one year above a thousand pound, that President was but once, one Swallow makes not a Summer, yet they are usually worth ten or fifteen pound per Acre.

They are a Fruit that keep not long, therefore if your store exceed your Market, a most excellent Wine is made of them, by those that delight in such Indagations of Nature.

Walnuts not without desert challenge a principal place in our Rural Plantation, the Tree groweth tall, is a great defence against Winds, a most excellent Ornament, delights in a dry, sound, and rich Land, if it incline to a feeding Chalk or Marle, also in stony grounds and on hills, especially Chalky, likewise in Corn-fields. In several places in *Germany* no young Farmer is permitted to Marry a wife, till he bring proof that he hath planted, and is a father of such a stated number of Walnut-trees. The Fruit will yearly sufficiently recompense the loss of the ground it drops with a good advantage, the Timber bears a good price, and is of excellent use in every place, strong and not subject to the Worm.

Stately Avenues, and large Plantations are of them in *Surry*, to the very great advantage, and recompence of the industry of the owners.

Sylva.

That which is produced of the thick shell of the Nut becomes the best Timber; that of the thinner, the better Fruit.

*9. Of Fil-
berts.*

These are a Fruit growing so low that we generally look over them, they delight in a fine mellow light ground, but will grow in almost any ground, especially if they are defended from the violent and cold Winds, the Tree is easily propagated, generally bears well, and yields a most excellent Fruit, not much inferior to the best and sweetest Almond.

Being planted in rows near the greater Trees, they will bear with the shadow of them, and give you a good reward for your Industry.

They are a Fruit that may be kept long in the husk.

*6. Of Quin-
ces.*

Quinces are a very good Fruit, the Trees delight in moist ground, and near the waters side, and where they like their ground they yield a very great increase, it is good to apply hot, and rich Soyls, to the roots of them, which will be fully repaid in the Fruit; There are several kinds of them, some are a small Crab-quince, others a fair, large kinde Quince, tis good to plant of the best sort, and the best bearers, the Portingal Quince is judged to be the best both for bearing and use.

Legacy.

Mr. Hartlib tells you of a Gentleman at *Prichnel* in *Essex*, who had a Tree from beyond-sea, and had the best in *England*, and had made above thirty pound of a small piece of ground planted with them.

*7. Of Mul-
berries*

They are difficult to propagate, they will grow in any reasonable good Land, the Fruit is made use of several ways, some make a Drink or Wine of them, its very good to colour Wine or Cider; But the greatest, and most principal benefit, and use of the Mulberry-tree is the leaf, being the onely known food for the Silk-worm; if the Trees were more encreased, it would be encouragement sufficient to keep these curious Creatures, although many have kept them, and made great quantities of the Silk, yet the difficulty of obtaining the leaves, and where they are, they grow in Gardens generally, few in quantity, and valued according to the ground they grow on, that its a great discouragement to that noble Improvement.

*Hartlib's Le-
gacy.*

Legacy.

If King *James's* Letter for the planting of Mulberry-trees were again revived, or some compulsive Statute to that purpose, and diligently prosecuted, it would produce in time a very considerable advantage to this Kingdom.

Or rather if his Majesty, or some honorable Person would allot some large parcel of Land, out of some Forrest or Chace to be wholly Cultivated for the raising of a Mulberry-wood, it would become a most noble President for others to imitate; For the principal Advantage must be raised on such Land

Land not yet improved, to the highest value by other Plantations, as usually Gardens are.

There are many kinds of Plums, and very much differing from each other; The better sorts, as the Mistle-plum, the Damazene, Violet, and Premorden-plums, with many other are very pleasant to be eaten, and require a very good rich warm Soil and place: the common ordinary Plums will grow almost any where, they are not worth the planting to be eaten, unless you can find a way to make a good Wine out of them, doubtless they yield store of Spirits, or *Aqua Vita*.

The Damzins is one of the best, wholesomest, and most profitable of Plums, and deserves a place in your Plantation: Mr. Hartlib gives it as a deficiency that the great Damzin or Pruin-plum is neglected which groweth well, and beareth full in England.

Plum-trees, and Damzins may also be planted in Hedges, being ordinarily thorny Plants, they will thrive there better than Apples or Pears.

The Medlar is a Fruit of very little use, the reason I suppose they are no more multiplied, yet have they been of long standing; they are pleasing to the Palate: This Tree may serve to fill up a spare Corner in your Orchard.

If we could obtain the Medlars without stones, mentioned in the *French Gardiner*, they would be better worth the planting.

The Barberry is a common Plant in Orchards, and bears a Fruit very useful in Housewifry: There are several sorts of them, although but one onely common, above which is to be preferred that which beareth its Fruit without stones: There is also another sort, and chiefly differs from the common kinde, in that the Berries are twice as big, and more excellent to preserve.

Mr. Hartlib condemns us much for neglecting the propagation of this Tree, which (saith he) groweth well, and beareth good Fruit, as he hath seen divers bushels on one Tree in his brothers Orchard; They grew large and upright, and need not the help of a Wall, the Almond is in some sweet, in others a little bitter. The Tree is chiefly received for the beauty of its Flowers, which being many, early, and of a fair, pale, reddish Colour, make a fine shew in a Garden.

The common Service-tree growes wild in many places: but there is a kinde thereof more rare, which by long standing grows to a fair Tree with many branches set with winged leaves like those of the Ash; but smaller and indented about the edges: the Flowers grow in Clusters, succeeded by Fruits, in some round, in others Pear-fashion, much bigger and better tasted than those of the common kind.

There are many sorts, and colours of Gooseberries, the White-holland, or Dutch-gooseberry is the fairest, and best bearer of all others; the berries are large, round, smooth, white, transparent, and well tasted.

Its not a small advantage that's yearly reaped by this Fruit, the Tree propagated with so much facility, and yields a wonderful encrease, and from the beginning of *May* to the middle of *July* contains a useful Berry.

14 Of Currants.

There are also several sorts, and colours of this Fruit, the best are the White being very pleasant, and the great Red which exceeds all the rest, is a plentiful bearer, and yields the largest Fruit.

There's no question but these Currans will yield a very pleasant, and sharp Liquor, which may exceed Vinegar, and compare with the Juice of Lemons, or Oranges, and so may become useful in the Kitchen.

15 Raspberries.

Raspberries are not to be omitted out of the number of the most pleasant, and useful Fruits.

Sect. 2.

Of Wall-Trees.

Having given you a taste of the most usual Fruits growing in the Fields, Orchards, or Gardens, on standards that necessarily depend not on any other prop or stay, I will now give you a list of such that are usually planted against Houses, Walls, Pales, or other Supports, not onely to preserve them from the violent percussions of the weather, but to Augment the heat of the Sun, for the sooner, and better maturating their Fruit; amongst which the Vine claims the Precedency, being esteemed by Ancient Philosophers the King of this Vegetable Kingdome, as man is of the Animal, and Gold of the Mineral, most Countrys of the World enjoying the delicious Fruits of this most excellent Plant: It is esteemed a great deficiency, that they are no more propagated in this Island than they are; many are of opinion they will prove well, being planted in Vine-yards as they do in *France*, and give many instances of Vine-yards that have formerly been in *England*; divers places yet retaining the name of Vine-yards, as in *Bromvel Abby* in *Norfolk*, and at *Ely* in *Cambridg-shire*, which afforded Wine, as these Rimes seems to testifie.

1 Of the Vine.

Hartlib's Letter.

Treatise of Fruit-trees.

Quatuor sunt Elia, Lanterna Capella Mariae,

Atq; Molendinum, nec non dans vinca Vinum.

Hartlib's Letter.

There are many places in *Kent* called by the names of Vine-yards. The same likewise in *Glocester-shire*, between *Glocester* and *Rosse*, is a place containing the name of a Vine-yard, as I was credibly informed travelling that way.

There are at this day several Presidents of making Wine in *England*, M. Hartlib gives an instance of one at *great Chart* in the *Wilde* of *Kent*, that yearly made six or eight Hogsheads, which was much commended by divers that tasted of it, and had kept of it two years; and also of a Gentlewoman that pressed her Grapes, and expecting Verjuice, drew Wine.

Without question our Grapes will afford good Wine, if we can finde places enough to bring them to such maturity, as some years they do on the House sides, and Walls, which hath been often attempted:

tempted: but I cannot understand that they Annually succeed according to expectation, neither indeed do they on the Houses, or Walls: the like inconveniences, though its probable not in so great a measure, are the Vineyards in other the Northern parts of *France*, and *Germany*, subject unto; which me thinks should not prove so great a discouragement, seeing that Hops, Apples, Cherries, &c. are also subject unto the same disappointments. But if they can be cultivated and raised to that state as to bear well, and ripen well in seasonable Summers, we may the better dispence with such casualties, as well in this, as other meanet productions.

The places most commodious for this use and purpose, and most free from those annual Casualties or Inconveniencies, must be so scituated, and defended either Naturally or Artificially, as to be free from the continual Assaults of the Winds; for any Wind in the Summer refrigerates, and impedes the Maturity of the Grape, and ought also to decline towards the South, if it doth not naturally decline enough, it ought to be so laid by Art, that its Elevation may be as neer as you can equal to the Elevation of the Pole, or somewhat less, that it may ly square to the Sun-beams, for the most part of the time the Sun passeth through the six Northernly Signs. The Banks or Borders so laid, ought also to be made circular (not streight) as though they contained about the eighth part of a Circle, the Center being in the South, like the Concave of the Burning-glass which burns by reflection, for by this means it doth as it were embrace, and detain the heat received from the Sun-beams, and breaks the Winds; For I have known the fairest, best, and most early ripe Grape to grow on the side of a House after the aforesaid manner cited, when on the same Tree, and on another part of the House, although it received as much of the Sun, they were not so good, nor early, by reason they lay more in the Wind, and the Sun-beams less direct.

There are several other things also to be considered of to accelerate the Maturity of this most excellent Fruit, as the Warmth, Richness, and Lightness of the Soyl, which may be much advanced by Art in applying of several Ingredients suitable to that purpose; also by covering the surface of the Ground with Tiles, Sand, or such like, that may keep down the Weeds, and afford some assistant heat.

It hath also been the usual practise to deprive the Vine of its leaves in the Summer, under pretence of laying the Grape more open to the Sun, but that hath proved rather than a help, an impediment to the Maturity of them, by depriving them of their shelter from the cool Airs, which in most Summers are more than the scorching heats; as I have often observed the best Grapes, and earliest ripe to be under the shadow, and protection of some Leaf; For what I have here said, and for what else is necessary towards the propagating of this Noble Plant, I must submit to the judgement, and experience of such persons worthy of honour, that have made far deeper essays than I have done, and are better

better capacitated by Reason, Judgment and Experience, to further and advance their Design.

The Choice of Grapes also is very necessary, Mr. *Hartlib* commends the Parsly-grape, the Renish-grape, the Paris-grape, and the small Muskadel, as most sutable to our Climate.

But if our Country-man be not minded, or have not conveniencies for the raising of a Vineyard, yet may it prove a very considerable advantage to plant Vines on the south east and west sides of his Houses, Barns, and Walls, and by good Culture, and Pruning they will yield a very considerable increase; I have known several bushels of Grapes grow on one Vine being well Pruned, when the same Vine neglected hath yielded very few, and those not so good as when there were many.

² *Of Apricks.* They are very well known almost every where, there are several kinds of them, some earlier, and some larger than the other, although the Tree will grow very well as a standard, yet it seldom brings its Fruit to Maturity unless it hath the benefit of some Wall or Pale.

There is lately a new mode of planting these, and other sorts of Fruit, as Apples, Pears, Peaches, Grapes, &c. in Dwarf-trees, that is, they are kept under hād, that they attain not to full three feet in height, by which means being under the Wind, and having the benefit of the reflecting heat of the Earth they produce their Fruit mature, and early.

³ *Of Peaches, &c.* Peaches, Nectarines, and Melacotones, are also to be planted against Walls, Houses, &c. and are of several sorts very much differing the one from the other, the best are best cheap.

⁴ *Of Figs.* These are also to be planted against Walls, but being of so little use in our Rural habitation, I shall leave them.

Other Fruits. There are some other Fruit-trees, as the Lote-tree, the Virginia Plum, the Cornel-tree, and such like, that are of small use, advantage or pleasure, which I leave to the Freedom of every man to plant or use as he pleaseth.

Sect. 3.

Of the Propagation of Fruit-Trees.

There are several ways of increasing or multiplying the fore-mentioned Fruit-trees, some by Grafting, some by Innoculation or budding, some from the Seed, Nut, or Kernel, others by Layers, Slips, and Suckers, whereof we will discourse more particularly, and first of Grafting. *Virgil 49.*

This Art hath been for many ages, the most proper speedy, and beneficial way to propagate several sorts of Fruits, although the same Fruits may be raised by Kernels, yet do they most usually prove wild, and in taste austere and sharp, tending rather to the wildeness of the stock on which the Tree (whereon the Fruit grew) was Grafted, and although they seem fair, yet they want that vivacity of spirit, and are more woody than the Grafted Fruit; they are also of a much longer continuance ere they bear, and

and are then not so fruitful. Sometimes Apples have proved well from the Kernell, and have proved much larger Trees, and have born great burthens (but when they have been many years old) and rather by accident, and at best not worth ones labor. Of other Fruits, as Plums, Cherries, Aprecocks, Peaches, &c. unless Grafted or Innoculated, are not of any value; Therefore this Art and Custome of Grafting or Innoculation, doth preserve the Species of our most dainty Fruits, and meliorate their Gusts, and affords us the most expeditious, pleasant, and advantageous way of gratifying our Senses, and fulfilling our desires in this most innocent of natural practises.

The Fruits that are to be Grafted are the Apple, Pear, Cherry, ^{1. By Graft-} Plum, and the Medlar; Filberds, Services, and Quinces, may also ^{ing.} be Grafted.

The first thing to be considered in Grafting, is the Stock, ^{ac-} ^{Stock to Graft} cording to the nature of the Tree you intend to raise must your ^{on.} Stock be; For Apples the sower the Stock is, the better is the ^{For Apples.} Fruit, therefore the Crab Stock is usually preferred; they will be more free from the Canker, will become large Trees, and last longer, the Fruits also will be better and harder on Crab, or sower Apple-stocks, than on sweet.

The best Stockes to Graft Pears on, are those raised from the ^{For Pears:} Kernel or the wild Pear Tree; the White-thorn is not good.

Cherries prove best Grafted on the Black-cherry Stock, which ^{For Cherries.} may be raised in great quantities from the stone.

Plums are to be Grafted on Plum-stockes, and no other. ^{For Plums.}

They may be Grafted on the White-thorn, but prove best on ^{For Medlars:} Pear-stockes.

Filberds may be Grafted on the common Nut, and Services on ^{For Filberds and Services.} their own kinde.

They also may be Grafted on their own kinde. ^{For Quinces.}

The Fruits that best succeed by Innoculation, are Aprecocks, ^{2. By Innoculation.} Peaches, and Nectorines; Gooseberries, and Currans, Plums, Apples, Pears, and Cherries, may also be Innoculated with good success, and several other sorts of Fruits, and Trees.

Aprecocks, Peaches, and Nectorines, are usually Innoculated ^{Aprecocks, &c.} in Plum-stockes, raised either from Suckers, or from Stones; those of the white Pear-plum are esteemed the best, and those of any other great white or red Plum that hath large leaves and shoots, ^{Pear-plum.} are very good either to Graft or Innoculate other choice Plums upon, or for the budding of Aprecocks, and Peaches.

The stones of Aprecocks and Peaches are not worth the setting for Stocks to Innoculate with other good kindes, in respect their Roots are Spongy, and will neither last nor endure to be transplanted; Therefore the Stones of Plums, and Cherries are chiefly for that purpose to be regarded.

Gooseberries and Currans are ^{Gooseberries, &c.} Innoculated on their own kinde, and so are Plums, Apples, Pears, and Cherries. ²

Sect. 4.

Of the Nursery for Stockes.

For the obtaining of a sufficient number of Stockes to Graft, and inoculate the several sorts of Fruits you intend to propagate and advance, and also to pleasure your self with such that may be suitable for your intended purpose, and not to be enforced to rely on such that the Country spontaneously affords, either for quantity or quality, prepare a Bed of Earth well dressed from Weeds, proportionable to the Seeds or Stones you intend to sow, and therein sow your Kernels of Crabs, or such like Apples as you intend to raise your Stockes from, & cover them with earth lifted or raked over them two or three fingers thick. This may be done about *October*, and so let ly till the Winter. For the Stones of Fruits, you may prick them down in rows, two or three fingers deep, with the sharp end downwards; You may also cover them with long dung or straw to keep them from the violence of Frosts which in *April* you may take off, and in *May* they will come up, and being kept from Weeds in, two years will be ready to remove into other Beds prepared for that purpose, whereof they are to be planted at a more convenient distance and better order, for the benefit of the Plant, and conveniency of the Grafter.

In *Autumn* is the most convenient time for this purpose, though it may be done any time in the Winter, or Spring, before they bud forth or spring: Let them be set in Rows about two feet distance, or as best pleases your self, and the Plants in each Row about six or eight inches apart, for the better conveniency of transplanting them; make the holes with an ordinary Settring-stick, and cut off the down-right Roots, and the tops and Side-branches of the Plants, and fasten the Earth about them: Let not the Roots be too long, nor set deep, because they are afterwards removed with more difficulty.

It is necessary to remove Seed-plants, for by that means they get good Roots; which otherwise they generally thrust down one single Root onely.

The Nursery thus set, may be ready after one year to Inoculate, and after two or three years to Graft.

Crab-stockes or Apple-stockes thus raised are better than those that come from the Woods, or any other ways.

Let the Kernels you raise your Nursery from, consist most, or altogether of Crabs or Wildings, for the Apple-Grafts.

Sylva.

Trees Grafted on a Gennet Moyl, or Cider-stocke preserve best the Gust of any delicate Apple; But on a Crab-stock the Tree lasts longer, and imparts a more juicy and tart relish and so are to be preferred before most sorts of Apples, the Wilde stock does enliven the dull and phlegmatique Apple, and the stock of a Gennet Moyl, sweeten and improve the Pepin, &c. or may rather seem to abate some Apple over tart and severe: The same Rules may be observed in the choice of Stockes, for Pears, Plums, Cher-

Cherries, Aprecocks, &c. the more acid the Stock, the more life it gives to the Fruit of the Graft, as the black Cherry, or the Cherry Tree is the onely Stock for the Cherry, &c.

Although the Fruit doth generally take after the Graft, yet is it somewhat altered by the Stocke, either for the better or the worse, as Apples or other Fruit Grafted on Stockes select, as before, advance or meliorate them; so if they are Grafted on Stockes of another contrary nature, much debaseth the Gust of the Fruit.

The Pear Grafted on a Quince-stocke produceth its Fruit better than the same kinde upon a wild Pear-stocke, and fairer, much better coloured, and the Trees to bear sooner and more store of Fruits; for the Fruit not onely receives something of the nature of the Stocke, as well as the Graff, but also of the Soil wherein they are planted, and of the Compost applyed unto them.

Therefore chuse a plat of Ground for your Seminary and Nursery that may be of an indifferent nature, not too much enriched with dung, nor too sterile, lying warm, the mould light, that the Stockes may the better thrive: Also let your Stockes be of Fruit select, as before, for that purpose.

If you desire to raise Dwarf-trees, Let the Stockes whereon you graff them, be of the *Paradise-apple* for Apples; of the Quince, for Pears; of the Morello, or common English Cherry, for Cherries, and so will they be the more fit for the Wall, or for standards, being kept low according to the new mode, though I see but little pleasure or profit in that way.

The best way to, and most expeditious to raise a great quantity ^{Perkins} of Quince-stockes for your Nursery, is to cut down an old Quince-tree in *March* within two inches of the ground, which will cause a multitude of Suckers to rise from the Root; when they are grown half a yard high cover them at the bottom a foot thick with good earth, which in dry times must be watered, and as soon as they have put forth Roots, in Winter remove them into your Nursery, where in a year or two they will be ready to graff with Pears.

Plum-stockes and Cherry-stockes may be raised from Suckers as well as from Stones, having regard to the kindes whence they proceed.

Sect. 5.

Of the Time and manner of Grafting.

Having thus prepared your Nursery, and raised a sufficient quantity of Stockes to graff, or innoculate on, you must consider the several ways, the several kinds of Fruits are to be propagated, and which are most suitable; and also the several times and seasons wherein to graff, and wherein to innoculate.

The times to graff in, are most usually in *February* and *March*, ^{1. The time} but I have grafted even unto mid-*April* some backward Fruits, and ^{for} *grafting*.
T
that

that with good success; You may begin also in *January*, especially with the more forward Fruits, as Plums, Cherries, &c. such that have many to do or much employment other way, may begin more early lest they want time.

You may either Graff or Innoculate at any time of the year except *October* and *November*, saith *Stephens* the Author of the *Country Farmer*, but whether that may be practised with success in these colder Countries I much question, but doubtless the temperature of the season doth very much conduce to the growth or proof of the Graff, as mild Weather in *December* or *January* may be better for this work than Frosty weather in *February*; Frosty weather at no time is fit to Graff in.

Evelins Pomona.

When the *Zephyres* of the *Spring* are stirring, choose that season before all others for this work.

2. Choice of Graffs.

Make choice of your Graffs from a constant and well-bearing branch. *Evelins Pomona.*

Pomona.

The Graffes of such Trees as are ill bearers, or not come to bear Fruit, are to be rejected, the Graffs always partaking of the quality of the Tree from whence they are taken.

Auslin of Fruit Trees.

Choose not those that are very small and slender, they commonly fail; but take the fairest upon the Tree, and especially those that are fullest of Buds.

In *Herefordshire* they do frequently choose a Graff of several years growth, and for the Grafting of such large Stocks as are taken out of the Woods or Nurseries, and fitted into rows; for Orchards they choose not the Graffs so small as in other Countries they require them.

Once for all, The stumpy Graff will be found much superiour to the slender one, and make a much nobler and larger Shoot; this upon experience. *Evelins Pomona.*

3. The keeping of Graffs.

Graffs of any kinde being cut before they begin to spring, may be kept many daies or weeks, and carried many miles, being bound up in Moss, the ends stuck in Clay or Earth, or being wrapped in oiled or waxen leather, or the ends stuck in a Turnep.

Many excellent Graffers assure us that the Graff which seemed withered and fit to be cast away, have proved the best when tryed; That the Graff a little withered and thirsty, is better received of the Stock. *Evelins Pomona.*

4. Instruments for Grafting.

Having your Stocks and Graffs ready at the time convenient, together with your Tools and other Materials, as the Pruning-knife, Pen-knife, or other small sharp knife to fit the Graffs withal, fine Saw, Mallet and Wedge, and also Rushes, or strong soft Flags, or wollen Yarne to binde the Graft and Stock together, and clay well tempered with Horse-dung to keep the same from chopping in dry weather, or soft Wax for the smaller Trees, and a small basket to carry the Graffs in, with such other Instruments and Materials as you shall judge necessary for your work, and suitable to the method you intend to proceed in, or as your own Ingenuity shall direct, then may you proceed in some or one of these several ways or manners of Grafting, viz.

Either

Either first by Grafting in the Cleft, which is the most known and Ancient way, and most usual for the greater Stocks, the manner thus; First, saw off the head of the Stock in a smooth place, for Wall-trees or Dwarf-trees within four fingers of the ground, for tall standards higher, as you shall think convenient, or your Stock will give way; then pare away the roughness the Saw hath left on the head of the Stock, then cleave the head (some advise a little besides the pith) and put therein the Wedge to keep the cleft open, which cut smooth with the point of your small sharp knife, that the sides may be even, then cut the Graff on both sides from some Knot or Bud in forme of a Wedge, suitable to the cleft with shouldrings; which Graff so cut, place exactly in the Cleft that the inward Bark of the Cion may joyn to the inward part of the Bark or Rind of the Stock closely, wherein lies the most principal skill and care of the Grafter, if he expects the success answerable to his labours or expectation, then draw out the Wedge, but if the Stock pinch hard, lest it should endanger the dividing of the Rind of the Graff from the Wood to the utter spoiling of the Graff, let the inner side of the Graff that is within the Wood of the Stock be left the thicker, that so the woody part of the Graff may bear the stress, or rather you might leave a small Wedge in the Stock to keep it from pinching the Graff too hard, and then may you leave the outside of the Graff a little the thicker, which I have usually done, as in smaller Stocks which pinch but weakly; herein also is required care and judgment, then cover the head of the Stock with the tempered Clay, or with soft Wax to preserve it, not onely from the extremity of cold and drying winds, but most principally from wet.

The second way of Grafting, and much like unto the former, *Grafting in the Bark* is Grafting in the Bark or Rind, and differs onely in this, that where you cleave the Stocks and fasten the Graffs within the cleft, in the other way, here, you with a small Wedge cut tapering downwards to a point thin like unto a half round File, and made of Ivory or Box, or other hard Wood onely force in the same Wedge between the Rind and Stock, after the head thereof is sawn off, and the roughness pared away, then you are to take the Graff, and at the shoulder or grossest part of it, cut it round with your small Grafting-knife, and take off the Rind wholly downwards, preserving as much of the inner Rind as you can, then cut the Wood of the Graff about an inch in length, and take away half thereof to the pith, and the other half taper it away, and set in the place you made with your Wedge between the Bark of the Stock and the Wood, that the shouldring of the Graff may joyn closely to the Bark or Rind of the Stock, and then with Clay and Horse-dung cover it as you do the other.

This way is with most conveniency to be used when the Stock is too big to be cleft, and where the Bark is thick: here you may also set in many Graffs in the same Stock, and with good success.

Also especial care is to be taken to keep the tops of your Stocks covered from time to time till the Bark it self hath covered it, to prevent the Rains from rotting the Stock, yet (as Mr. Evelyn saith in his Pomona) it has been noted, that many old Trees quite decayed with an inward hollowness, have borne as full burdens and constantly, as the very soundest, and the Fruit found to be more delicate than usually the same kinde, from a perfect and more entire Stock.

Leave not your Graff above four, five, or at most six inches above the Stock, for being too long they draw more feebly, and are more exposed to the injuries of weather, and hurt by birds, and prosper not so well; but herein regard is to be had to the greatness of the Stock, and its ability to furnish the Graff with Sap sufficient.

Evelyns Pomona.

Graff your Cions on that side of the Stock where it may receive the least hurt from the South-west wind, it being the most common, and most violent that blows in Summer, so as the wind may blow it to the Stock and not from it; Regard is here also to be had to the situation of the Nursery or place you Graff in.

Shoulder or Whip-grafting.

The third way of Grafting that is made use of, and to be performed somewhat later than the other, and seems to be of later invention, because it is not so generally taught and used as the former, is Shoulder or Whip-grafting, and may be done two ways. First, by cutting of the head of the Stock, and smooth it as in Cleft-grafting, then cut the Graff from a Knot or Bud on one side, sloping about an inch and a half long with a shouldring but not deep, that it may rest on the top of the Stock, the Graff must be cut from the shouldring smooth and even, sloping by degrees, that the lower end be thin: place the shoulder on the head of the Stock, and marke the length of the cut part of the Graff, and with your knife cut away so much of the Stock as the Graff did cover, (but not any of the wood of the Stock) place both together that the cut parts of both may joyn, and the Saps unite the one in the other, and binde them close together, and defend them from the Rain with tempered Clay or Wax, as before.

The second way.

The other way of this Whip-grafting is where the Graffs and Stocks are of an equal size, the Stock must be cut sloping upwards from the one side to the other, and the Graff after the same manner from the shoulder downwards, that the Graff may exactly joyn with the Stock in every part, and so binde, and Clay, or Wax them, as before.

These (especially the first way) of Whip-grafting are accounted the best. 1. Because you need not wait the growing of your Stocks; for Cleft-Grafting requires greater Stocks than those ways. 2. This way injureth less the Stock and Graff than the other. 3. The wound is sooner healed and thereby better defended from the injury of the weather, which the Cleft-stock is incident unto. 4. This way is more facile, both to be learned and performed.

Grafting by Approach.

The fourth way of Grafting is by Approach or Ablatation, and this

There is another way of grafting lately invented, which by taking a graft or sprig of the tree you design to propagate, and a small piece of the Root of another tree of the same kind, or very near it, and strip-graft them together, and sink them well, plant this tree where you intend it shall stand, or in a nursery, and piece of root will draw sap, and feed the graft, as soon as the stock after 7 other ways.

You must observe to unite the two Butt-ends of the graft & Root, and that the Rinds of the Root joint to the rinds of the graft.

By this means the Roots of one Oak-stock or Apple-stock will serve you for 20 or 30 Apple-grafts: And in like manner of a Cherry or Cherry-stock for as many Cherry-grafts; And so of Pear, Plum &c.

Thus you may also raise a Nursery of Fruit-trees in stead of Stocks, by planting them there, when they are too small to be planted a broad, where they are subject to perishing.

This way more than any other, is best for the raising of tender trees, that will rarely succeed the grafting in the stock, for here they are not exposed to the injuries of the Sun Wind or Rain.

It is also prov'd that Grapes may be propagated, by grafting them on Roots of a different kind because they are more apt to take this way than any other.

The Trees thus grafted will bear sooner, and be more safely preserved than any other, because part of the very graft is in the ground, not being taken off from a bearing sprig or branch with the young one, and so in order, in case the Root is a loss to maintain it.

The only objection against this way is this, that the young tree grows slowly at first, which is occasion'd by the smallness of the Root that feeds the graft, for in all trees the Head must attend the growth of the Root, for without it hath its nourishment.

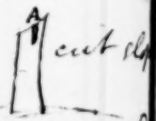

Notwithstanding this work is easily performed, Roots being more plentiful than stocks, and may be found in great quantities in a little time within doors, and then planted so very easily, with a silver Dibble in your Nursery, and will grow in time infinitely to recompence your pains.

(Signature)

There is one way of Grafting call'd whip & tongue
easy to be done as any, & which seldom fails

Let your stock be pretty small & take a Cion
the same bignesse & cut your stock sloping as you
must your Cion too, so as being set upon the stock it
may stand upright. then cut a short slit in the
& Cion which being thrust the one into the other the
may hold together & exactly correspond, so as that
Bark all round both of the Stock & Cion may be join'd
then dawb it with Clay &c

This however difficult it may seem to
in the Theory, yet being once seen done, it will
be very easy & is in all Respects preferable to
any way of Grafting yet invented.

Let your stock be suppos'd to be thus,  cut sloping
on the Top & a little cut down as in y^e figure
Suppose the Cion to be  thus sloping the other way
Place the one on the other & make them both open at
the slits AA. but observe that they may the better unite
that they answer each other all round & then fasten
them with Clay & Dung &c 1713.

Note altho' your Cion be not so bigg as the
stock, it will successfully do if a little part
of its Bark be plac'd so as it may conveniently
unite to the Bark of the Stock

this is performed later than the former ways, to wit, about the moneth of *April*, according to the state of the Spring; It is to be done where the Stock you intend to Graff on, and the Tree from which you take your Graff stand so neer together, that they may be conjoynd, then take the Sprig or Branch you intend to Graff, and pare away about three inches in length of the Rind and Wood neer unto the very pith; cut also the Stock or Branch on which you intend to Graff the same, after the same manner that they may evenly joyn each to other, and that the Saps may meet, and so bind them and cover them with Clay or Wax, as before.

As soon as you perceive the Graff and Stock to unite and be incorporated together, cut off the head of the Stocks (hitherto left on) four inches above the binding, and in *March* following the remaining stub also, and the Cion or Graff underneath, and close to the Grafted place, that it may subsist by the Stock onely.

Some use to cut off the head of the Stock at first, and then joyn the Cion thereunto, after the manner of Shoulder-grafting, differing onely in not severing the Cion from its own Stock; both ways are good, but the first more succesful.

This manner of Grafting is principally used in such Plants that are not apt to take any other way, as *Oranges, Lemons, Pomgranats, Vines, Gessamis, Althea-frutex*, and such like; by this way also may attempts be made to Graff Trees of different kinds, one on the other, as Fruit bearing Trees, on those that bear not, and Flower-trees on Fruit-trees, and such like. I have also by this inverted the top of a Cion downwards into the Stock which hath taken, and afterwards cut off the Graff three or four buds above the Stock which grew, although but slowly, by means of the Sap being forced against its usual Current,

These are the most usual ways of Grafting, some other there are, but they differ so little from the former, and where they differ its rather for the worse, and therefore not worthy the mentioning.

Those Graffs that are bound, you must observe to unbinde them towards Mid-summer, lest the band injures them.

Where their heads are so great that they are subject to the violence of the Winds, its good to preserve them by tying a stick to the Stock, which may extend to the top of the Graff, to which you may binde the Graff. The first year the best thriving Graffs are most in danger, afterwards they rarely suffer by the winds.

Graffs are also subject to be injured by birds, which may be prevented by building some small Bushes about the tops of the Stocks.

SECT. 6.

Of the time and manner of Innoculation.

Next unto Grafting, Innoculation takes place, by some preferred before any of the ways of Grafting before treated of; It differs from the other ways in this, that its performed when the Sap

is at the fullest in the Summer, and the other sorts of Grafting are before the Sap ascends, or at least in any great quantity; Also by this way of Innoculation may several sorts of delicate Fruits and Trees be propagated, and meliorated, which by Grafting cannot be done, as the Aprecock, Peach, or Nectarine rarely thrives any other way than this, because few Stocks can feed the Graff with Sap so early in the Spring as the Graff requires it, which makes it frustrate your expectation, but being rightly Innoculated in the fulness of the Sap rarely fails.

The Stocks on which you are to Innoculate are to be of the same kinde, as before we directed to Graff on.

1. *The time
for innoculation*

The time for this work is usually from Mid-summer to the middle of July when the Sap is most in the Stock; some Trees, and in some places, and in some years you may Innoculate from *Mid-May to Mid-August*. As to the time of the day, it is best in the Evening of a fair day, in a dry season, for Rain falling on the Buds before they have taken, will destroy most of them.

2. *The choice
of Buds,*

The Buds you intend to Innoculate must not be too young nor tender, but sufficiently grown, the Aprecock Buds are ready soonest, they must be taken from strong and well grown shoots, of the same year, and from the strongest and biggest end of the same shoots.

If Buds be not at hand, the Stalks containing them may be carried many miles, and kept two or three days, being wrapt in fresh and moist Leaves and Grass, to keep them cool; If you think they are a little withered, lay the Stalks in cold water two or three hours, and that, if any thing, will revive them, and make them come clean off the Stocks.

3. *Instru-
ments for In-
noculation.*

Having your Buds and Instruments ready for your work, *viz.* a sharp poynted knife or Pen-knife, a Quill cut half away and made sharp and smooth at the end to divide the Bud and Rind from the Stalk, and woollen yarn or dry Rushes, Flags, or such like to binde them withal. Then,

4. *The manner
of Innocula-
tion.*

On some smooth part of the Stock, either neer or farther from the ground, according as you intend it, either for a Dwarf tree or for the Wall, or a tall standard, cut the Rind of the Stock overthwart, and from the middle thereof, gently slit the Bark or Rind about an inch long in form of a T not wounding the Stock, then nimbly prepare the Bud, by cutting off the leaf, and leave onely the tail about half an inch from the Bud, then slit the Bark on each side the Bud, a little distance from the Bud, and take away the Bark above and below, leaving the Bark half an inch above and below the Bud, and sharpen that end of the Bark below the Bud, like a Sheild or Escutcheon that it may the more easily go down, and unite between the Bark and the Stock; Then with your Quill take off the Bark and Bud dexterously, that you leave not the Root behind; for if you see a hole under the Bud on the inside, the Root is gone, cast it away and prepare another; when your Bud is ready, raise the Bark of the Stock on each side in the slit, (preserving as carefully as you can the inner thin Rind of the

the Stock) put in with care the Shield or Bud between the Bark and Stock, thrusting it down untill the top joyn to the cross cut, then binde it close with your yarn, &c. but not on the Bud it self.

There is another way of Innoculation more ready than this Another way to Innoculate. and more successful, and differs from the former, onely that the Bark is slit upwards from the Cross cut, and the shield or Bud put upwards, leaving the lower end longer than may serve, and when it is in its place, cut off that which is superfluous, and joyn the Bark of the Bud to the Bark of the Stock, and binde it as before, which sooner and more successfully takes than the other, as I myself have experienced.

I have also cut the edges of the Bark about the Bud square, and have cut the Bark of the Stock fit to receive the same, and bound it fast, which succeeded very well, and is the readier way, and more facile. Another way.

About three weeks or a months time after your Innoculation you may unbinde the Buds, lest the binding injure the Bud and Stock.

When you unbinde them you may discern which are good, and have taken, and which not; the good appear Verdant and well coloured, the other appear dead and withered.

In March following cut of the Stock three fingers above the Bud, and the next year cut it close that the Bud may cover the Stock as Graffs usually do.

Sect. 7.

Of Raising Fruit-Trees by the Seeds, Stones, Nuts, or Kernels.

We have given you a short survey of such Fruits as are propagated by Grafting and Innoculation, and the way or Method of promoting the same. Now we are to touch upon some few Trees or Fruits that are raised from their own Seed or Kernel, as Almonds, Services, Wallnuts, and Filberts, some others there are, as Oranges, Lemons, and such like, not necessary for our Rural Theatre, therefore shall say little to them.

But the onely known and beneficial way to propagate the Wall-nut-tree, Wallnuts. is from the Nut, which from the time of gathering of them you may keep, and preserve in Beds of Sand or Earth till March, and then plant them if you can in the places where they are to abide; for so will they prosper exceedingly and much more than any removed, but if you remove any, be cautious of cutting the Branches or Roots, lest you endanger the Tree.

Be careful to preserve the Nuts from Mice; for if they can come at them you will have but few left; Although I planted some hundreds in their Husks, and a great number of them wrapped in Clay, yet were all to a very few transplanted by the Mice.

Filberts also may be raised from the Nut, and are easier obtained, Filberts. and carried farther than the Suckers or Plants of the same Tree, and are raised and ordered as Plum-stones or Wallnuts are.

Almonds.

Its the best and most usual way also to raise Almond-trees from the Stone, which must be set in the place they are to abide, not easily growing after a remove.

Chesnuts and Services.

Chesnuts and Services, are also raised from the Fruit of them by being sown in your Seminary, and thence removed.

Sect. 8.

Of Raising and Propagating Fruit-Trees, by Layers, Slips, and Suckers.

There are also several sorts of Fruits that are to be raised with more advantage, and facility from Layers, Slips, or Suckers, than from Graffing, Innoculation, or from the Seed, and such are Quinces, Filberds, Vines, Figs, Mulberries, Gooseberries, Currans, and Barberries.

Quinces.

The manner of raising the Quince we have already discovered, where we treated of raising Stocks to Graff on.

Filberds.

Filberds are generally drawn as Suckers from the old Trees, and will prosper very well, and sooner come to be Trees, than from the Nut.

The Vine.

Any shoot of the last year, more especially if a short piece of the former years growth be cut with it, will grow being laid about a foot, or eighteen inches within the ground long-ways, and not above two or three Buds at most out of the ground, about the moneth of February, and watred well in the drought of Summer.

Figs.

The Fig-tree yieldeth Suckers, which is the usual way to multiply them.

Mulberries.

The Mulberry is a very difficult Tree to raise, and is best done thus: Cut a Bow off as big as a mans Arme, and cut it in pieces a yard long, or less, lay all these in the ground a foot deep, onely one end out of the ground about a hands breadth; let it be in fat and moist ground, or usually watred, and after a year or two divers young Springs may be drawn with Roots, and planted at a distance, and the old Roots will yet send out more.

Gooseberries, Currans, and Barberries.

These three kinds of Fruits yeld such plenty of Suckers, that you never need doubt of a supply.

To lay the Branches of Trees.

But if you desire Plants from the same, or any other sorts of precious Fruits or Plants, and where you cannot obtain Suckers from the Roots, and where the branches will not easily take Root being seperated from the Tree, you may obtain your desire by bending down some branch of the Tree to the ground, and with a hooked stick thrust into the ground, stay the same in its place, and cover the same branch with good Earth, as thick as you shall think fit, and keep the same well watred; or if you cannot bring the branch to the Earth, you may have some Earthen-pot, Basket, or such like, with a hole in the bottom, and fasten the same to the Wall (if against a Wall) or on some post or stake: put the Sprig or Branch you intend to Plant through at the hole, and fill the same with good Earth, and water it often as before; some prick

prick the Rind that is in the Earth full of holes, that it may the better issue thereout small Roots, others advise to cut away the Bark; This may be done in the Spring from *March to May*, and the Plant will be fit to be cut off below the Earth the Winter following; by this means you may obtain the Plants of Vines, Mulberries, or any manner of choice Fruits or Plants.

The *Gennet-Moyl*, and *Kentish-Codling*, may also be very expeditiously, and successfully propagated by Slips set in the Earth, as it found by experience.

Sect. 9.

Of the Transplanting of Trees.

The best and most successful time for the transplanting or removing of Trees (such that shed their leaves in the Winter) whether they are the young Stocks, or new Grafted Trees, or of longer standing, is in the Autumnal quarter when the Trees have done growing, about the end of *September* you may begin, the prime time is about the middle of *October*, you may continue till the Tree begins to bud, if the weather be open.

Be careful in taking up the Plants, that requiring great care of the Remover, see the Roots be left on as much as may, especially the spreading Roots, and let the Roots be larger than the head, the more ways they spread the better, but you may take away such Roots as run downwards, also take off the leaves if any, least they weaken the Branches by extracting the Sap.

The younger and lesser the Tree is, the more likely he is to thrive and prosper, because he suffers less injury by the removal than an older or greater Tree; And an Orchard of young Trees will soon overtake another planted with larger Trees at the same time.

Plant not too deep, for the over-turf is always richer than the next mould, and in such places where the Land is Clayish, overmoist, or Spewy, plant as neer the surface as you can, or above it, and raise the Earth about the Tree rather than set the Tree in the wet or Clay. The same rule observe in Gravelly or Chalky Land, for the Roots will seek their way downwards, but rarely upwards; that I have known Trees planted too deep pine away, and come to nothing. This rule observed, many places may be made fruitful Orchards than now are, judged impossible, or not worth ones while.

In the Transplanting of your young Trees, you may prune as well the Branches as the Roots, takeing away the tops of the Branches in Apples and Pears, but not in Plums and Cherries.

The Coast also is necessary to be observed, especially if the Tree be of any considerable bigness, that the same side may stand south that was south before, the Tree will thrive the better; Although in small Trees it be not much observed, yet it might prove none of the least helps to its growth and thriving. The most facile way to preserve the memory of its situation, is to mark the south

or north side of the Plant with Oker, Chalk, or such like before you remove it.

It is not a small Check to a Plant to be removed out of a warm Nursery, into the open Field, where the Northern and Eastern Winds predominate; or its shelter to be removed, as by the cutting down of Hedges, and other Trees that formerly defended them.

It is also very necessary to be observed, that the ground into which you plant your Tree be of a higher and richer mould than from whence you removed it, if you expect your Tree to thrive, the Change of Soyls or Pastures from the worser to the better being of very high concernment for the improvement and advance of all Vegetables and Animals.

These and several other the like Observations if they can be observed, will much advantage the growth of your Tree for the first year or two; but if place and time, and other accidents will not admit thereof, in a short time the Plant may by the care and diligence of the Planter, overcome those inconveniencies or obstructions.

Let not the Ground wherein you plant Apples be too much enriched with dung, they requiring rather a Vulgar and ordinary light mould.

3. The distance of Trees

According to the nature or quantity of your ground or Trees may the distance be, but the usual distance and most convenient for Apple-trees or Pear-trees for an Orchard, may be from twenty to thirty feet if you expect the benefit of the Land, under and between them either for Grass or Tillage, or that you plant them in your Fields or Pastures, then from thirty to sixty feet may your distance be: The farther distance they are, the more benefit and refreshment do they receive from the Sun and Ayre, the Fruit are much the better, and the Trees prosper the better also; And if they are too neer together, the ground is for the most part of no advantage under them, neither do the Trees thrive so well, nor are so fertile.

Cherry-trees, Plum-trees, Quince-trees, and such like, may be planted about fifteen or twenty feet distance, which is sufficient.

Wal-trees may be planted at such distance, as the height or breadth of the Wall, the nature of the Tree, and the nature of the ground requires; the higher the Wall, the neerer together the Trees; and the lower the Wall, the farther distance that they may have the room to spread in breadth which they want in height; Vines require a more spacious and ample Wall or place to spread against than any other Fruit, next to that the Pear, then the Apricock, the Peach, the Nectarine, and then the Cherry, the May-cherry, &c.

For the distance of other small Trees, as Filberds, Goose-berries, Currans, &c. you may plant them at such convenient distance that the branches may not entangle the one in the other, according to your own discretion.

Codlings, Cherries, Plums, &c. may be planted to make hedges

es withall, and then are to be planted neer together, the neerer the sooner it will be a hedge, the farther distance the more Fruit will they bear, but not so soon a hedge.

If you designe to fill your Plat of Ground with all sorts of Fruits for your greatest advantage, then plant several Rows of Apples and Pear-trees at a convenient distance, in each Row, but the Rowes of a farther distance each from the other, and then about ten or fifteen feet on each side the Rowes of the greater Trees, plant a row of Cherries, Plums, or such like Trees of a lesser stature or growth, and neerer together than the Apple or Pear-trees; next unto them also at a convenient distance a Row of Filberds, and next unto them Gooseberries, Currans, Rasberries, or such like small Fruit, leaving onely a Walk between the lesser Trees; For by this means will the whole ground be supplied and by that time that the greater Trees are grown to any competent stature, the lesser will be decayed, that the greater Trees may have the sole predominacy.

But the most compleat order in the planting of an Orchard of the larger Fruit-trees, is that which they terme the *Quincunx*, by planting them at an equal distance every way, onely with this observation that every Tree of the second Row may stand against the middle of the space of the first, in the third against the space of the second, and so throughout, which makes it appear pleasing to the eye in what part of the Orchard soever you stand.

In planting of Trees observe this Rule, That if the crookedness of the Tree will enforce you to plant it leaning, or tending any way, let it be to the west from whence the strongest winds blow, or to such coast your Orchard is most obvious.

Sect 10.

Of the Pruning of Trees.

It conduceth very much to the proof and growth of a Tree to be pruned, or the unnecessary and injurious branches to be taken off by the skillful hand of the Husbandman.

When your Graffs are grown half a yard high, those you finde to shoot up in one lance, pinch off their tender tops, which will prevent their mounting, and cause them to put forth side-branches: Its found to be the best way to guide a Tree, either to grow or extend it self in height, or to cause it to spread in breadt h, it gives not that wound to Trees that incisions or lances usually do, and besides this may be done at that season, when the taking away of a Bud prevents the expence of Sap, in waste, and diverts its course to others necessary to remain.

In *March* is the best time to take away the small and superfluous Branches, giving the lance close behind a Bud, a thing to be specially observed in Pruning.

Wall-trees are to be pruned in the Summer and in the Winter; In the Summer about *June* or *July*, you may take of such superfluous sprigs or shoots of the same years growth, off from Vines,

1. The pruning of young Trees.

2. Of wall-trees.

Appecocks, or other Trees that put forth many large shoots, that impede the Fruit from its due maturation, and contract much of the Sap of the Tree to themselves, and thereby rob the other.

In the Winter as soon as the leaves are off the Trees, you may prune and cut away the residue of the Branches, and place those that are fit to be left in order: this work may be continued throughout the Winter to the rising of the Sap, except in great Frosts when it is not good to wound the Vine, or any other tender Plant; some hold *February* to be the best time to plash, prune, and nail Trees after the great Frosts are past, except *Peaches* and *Nectarines*, which being cut before the rising of the Sap, are apt to die after the Knife, and so stump and deform the Tree; Therefore such must be left till they begin to put forth Buds and Blossoms.

3. The Pruning of old Trees.

The greater Trees in your Gardens, Orchards, Fields, &c. may be pruned in *October*, *November*, or thence forward to the rising of the Sap; Observe to cut away superfluous Branches, such as cross one the other, as grow too thick, or that offend any other Tree or place, or that are broken, bruised, or decaying; The Tree will be the better preserved, and the remaining Branches will yield the greater increase.

Sect. II.

Other necessary Observations about Fruit-Trees.

1. Of the raising of Land.

Where the ground is shallow, or lieth neer Gravel, Clay, Stone, or Chalk, or neer the Water, take the top of one half of the same Land, and lay it on the other, in Ridges, abating the intervals like unto Walks, and plant the Trees on the midst of the Ridges, by which means they will have double the quantity of earth to root in, that they had before, and the Walks or Intervals preserve the Ridges from superfluous moisture: It hath been found an approved Remedy in dry, shallow Land, as well as in low, wet Land.

Pear trees.

It hath been observed that Pear-trees will thrive and prosper in Cold, Moist, Hungry, Stony, and Gravelly Land, where Apples will not bear so well.

2. Of the ordering the Roots of old Trees.

The Roots of such Trees that thrive not, nor bear well may be laid open about *November*, and if the ground be poor and hungry, then towards the Spring apply good fat mould thereto; but if the ground be overfat and rich, that the Tree spends it self in Branches and Leaves with little Fruit, then apply to the Roots Ashes or Lime, or any of the Composts that are salt, hot, and dry, mixed with the Earth, which contain more of fertility than the ordinary dung.

Also laying store of any manner of Vegetables all the Summer about the Roots of Fruit-trees, to kill the Grass and Weeds growing about the Tree, it keeps the ground moist and cool, and adds much to the flourishing and fertility of the Tree, and is the best natural remedy against the Moss.

Dig.

Digging or Ploughing about the Roots of Fruit-trees, adds much to their fertility, and prevents the Moss in most Trees.

Stones laid in heaps about the Roots, preserves them cool and moist in the Summer, and warm in Winter, and is of great use, and concernment to the fertility, and advance of the growth of Fruit-Trees.

The ground wherein you plant your Fruit-Trees if you finde it not suitable to the Nature of the Tree, may be several ways altered as before: and by the applying of Earth, Clay, or Sand of a divers nature from the ground where the Tree grows. ^{3. Alteration of ground.}

If your Orchard or Garden be not naturally well scituate, and defended from the injurious Winds, by Hills, or Woods; or that Buildings, Barns, Walls, or such like, are not conveniently scituate neer to preserve it, it is of great advantage, to raise a perpetual, lasting, and pleasant shelter, by planting a compleat Thorne-hedge about the same at the time, or in that year you first plant your Orchard or Garden, which will grow in a few years to a considerable height, and very much break the cold Winds, and preserve the smaller, and lower part of the greater Trees in their blossoming and kerningtime, from the nipping Winds; but for that, that the principallest parts of the greater Trees exceed the Summit of the White-thorn, the Walnut-tree raised in time on the borders or naked sides of the Orchard or Garden, and if you can on the outsides of the Fences, will prove a noble and profitable defence from the furious Winds. ^{4. Defending Trees from Winds. White-thorn. Walnut-tree.}

If you regard not the Fruit or Profit so much as the pleasure, and sudden rise of such a defence, that which is most facile and expeditious to be raised is the Poplar, which may be planted neer together, and ten or fifteen feet in height the first year, which will prove and thrive wonderfully, especially if the ground be any whit inclinable to moisture. ^{Poplar.}

Or the Lime-tree, if you can conveniently obtain them, make a close and secure defence from the Winds, and of all other is the most odoriferous, regular, and delicious verdant Pale to a Garden or Orchard. The Sycamore, and the Elm also are not to be rejected. ^{Lime tree.}

At the removal of Trees, the trimmings of the Roots planted, or rather buried in the ground within a quarter of an inch, or little more of the level of the Bed, will sprout and grow to be very good Stocks. ^{5. Raising Stocks. Evelins Pomona.}

Pigeons dung, or the dung of Poultry, or any Fowl, being of a hot, dry, and salt nature, hath been experimentally found to be the Soyl most conducing to fertility for Fruit-Trees, especially in cold grounds. ^{6. Soyl for Fruit-trees.}

It is usuall to select aspiring Trees, and to expect the fairer Trees (because taller) and better and more Fruit, than those that are low; 'tis true the more remote the Branches are from the Earth, the less are they subject to the injuries of Cattel, or the Fruit to light fingers. ^{7. Height of Trees.}

But the lower the Tree brancheth it self and spreads, the fairer and

and sooner will it attain to be a Tree, and the greater burthen will it bear of Fruit, and those better, and larger: The Tree and Fruit will also be less obvious to the furious Winds, which make havock most years of a great part of our Stock; And in the Spring the new kernald Fruit will be more within the shelter of the Natural or Artificial Securities from the nipping cold morning Breeze, and the Fruit when ripe and apt to fall, will not receive so great injury, from the humble, as from the aspiring Tree. *Sed medio Virtus.* As the tall Tree is not for your advantage, so the Tree that's too low is not for your conveniency. I aime not at extreams.

3. Diseases of Trees. Moss. In many places Fruit-Trees are much injured by Moss, it rarely grows on Trees where the ground is yearly digged, ploughed, or otherwise preserved from Grass or Weeds, as we noted before. If the cold, moist, or barren nature of the ground be the cause, then rectifie the same, as before; after Rain you may scrape off the Moss with a knife, or rub it off with a hair-cloth.
- Bark-bound. If the Tree be bark-bound, and thrive not well, with a knife you may slit the bark down the body of the Tree in *April* or *May*, and it will cure it.
- Canker. If the cleft where the Tree was grafted, or any other wounded place be neglected, the Rain is apt to engender the Canker; the cure is difficult, if too far gone; there are many perscriptions for the Cure of it, but if the cutting off of the Canker or cankered Branches will not cure it, and the Tree be much infected with it, the best way is to place a better in the room.
- Worms in the bark. Some Trees are hurt with small worms that breed between the Bark and Wood, which makes the Bark swell, cut away part of the Bark and wash with Urine and Cow-dung.

Sect. 12.

Of the Use and Benefit of Fruits.

Not any of the aforementioned Fruits, but are very pleasant, necessary, and profitable, to many of our English Palates; the most of them being a familiar food, to the noble and ignoble. These extend their vertue also to the Cure of many Infirmities or Diseases, being judiciously applied.

But over and above their use for food, for pleasure, and for Physick, to be converted into so many several sorts of curious, pleasant, palatable, and lasting Liquors, is not the least of the benefits accrewing unto the Husbandman, from the diversity of Fruits by him propagated. Next unto Wine (whereof we treat not in this place) Cider is esteemed the most pleasant, natural Liquor our English Fruits afford.

1. By Cider. Several are the ways used in making this excellent Liquor, and that according to the skill of the Operator, and divers kinds of the Fruit whereof it is made.

Cider-fruits may be reduced into two sorts or kinds, Either the wild, harsh, and common Apple, growing in great plenty in *Hereford*,

ford, Worcester, and Gloucester-shires and in several other adjacent places in the Fields and Hedge-rows, and planted in several other places of England for Cider onely, not at all tempting the Palate of the Thief, nor requiring the charge and trouble of the more reserved inclosures.

Or the more curious Table-fruits, as the *Pippin*, *Pearmain*, &c. which are by many preferred to make the best Cider as having in them a more Cordial and pleasant juice than other Apples.

For the former, the best sorts for Cider are found to be the *Red-break*, the *White-Must*, and the *Green-Must*, the *Gennet-Moyl*, *Eliots*, *Stocken-Apple*, *Summer-Fillet*, *Winter-Fillet*, &c. Cider-fruits.

The greater part of them being meerly savage, and so harsh that hardly Swine wil eat them, yet yielding a most plentiful, smart, and winy Liquor, comparable, or rather exceeding the best French Wines; And for the advantage of planting them, they claym a preference before *Pepins*, or any other our pleasant Garden-fruits, especially the *Red-break* which Mr. *Evelin* so highly commends, as at three years grafting to give you fair hopes, and last almost an hundred years, and will bear as much fruit at ten years, as *Pepins* or *Pearmains* at thirty.

The best sorts of Cider-fruit are far more succulent and the Liquor more easily divides from the Pulp of the Apple, than in the best Table-fruit.

Some observe the more of red any *Apple* hath in his rind, the better for Cider; the paler, the worse. No *sweet Apple* that hath a tough rind, is bad for *Cider*.

Cider Apples require full Maturity, ere they be taken from the Trees: And after they are gathered (which is to be done with as much caution as may be, to preserve them from bruises) it very much conduces to the goodness and lasting of the Cider to let them lye a week or two on heaps out of the Rain and Dew; the harsher and more solid the Fruit is, the longer may they lye; the more mellow and pulpy, the less time; this makes them sweat forth their aqueous humidity, injurious to the Cider, and maturated the Juice remaining, and digesteth it more than if on the Tree, or in the Vessel; But its probable they will yield more from the Tree than so kept, but not so good. Making of Cider.

Such that are Wind-falls, bruised, or any ways injured, or unripe fruit, divide from the sound, and mature; Its bitter to make two sorts of Cider, the one good, the other bad, than onely bad; Take away all stalks, leaves, and rotten Apples, the stalks and leaves give an ill taste to the Cider, the rotten Apples makes it deadish.

Let such that are through casualty or otherwise fallen from the Trees before their full time of maturity, be kept to the full time, else will not the Cider be worth the drinking.

About twenty or twenty two bushels of good *Cider Apples* from the Tree will make a *hoghead* of Cider, after they have lain a while in heaps to mellow, about twenty five bushels will make a *Hoghead*.

Then

Then either grind them in a Horfe-mill, like as Tanners grind their Bark, or beat them with beaters in a Trough of Wood, but rather of stone, the more they are ground or beaten the better.

Soon after the grinding it should be prest, either being Artificially made up with Straw in form of a Cheese, as the experienced Country-man may direct you; Or in a Hair-bag (the more ordinary way for small quantities) and so committed to the *Press*; of which there are several sorts, but the *Screw-press* is to be preferred.

Immediately after its prest, strain it and turn it up into the Vessel, and place it wherein it may stand to ferment, allowing but a small *Vent-hole*; lest the spirits waste; fill not the Vessel quite till it hath done working, then fill the Vessel of the same kept for that purpose, and stop it well onely with caution at the first, lest it break the Vessel.

The best Vessels for the tuning up of Cider, and to preserve it, are those whereof the barrel boards are streight, the Vessel broader at the one end than the other, and standing on the lesser end, the Bung-hole on the top, the conveniency is, that in the drawing the Cider, though but slowly, the Skin or Cream contracted by its Fermentation descends, and wholly covers the Liquor by the tapering of the Vessel, and thereby preserves the spirits of the Cider to the last, which otherwise would waste, and expend themselves.

If you intend a mixture of Water with your Cider, let it be done in the grinding, and it will better incorporate with the Cider in the grinding and pressing, than afterwards.

Some Cider will bear a mixture with water, without injury to its preservation, others will not, therefore be not over hasty with too much at once, till you understand the nature of your Fruit.

Some advise that before it be prest, the *Liquor* and *Must* should for four and twenty hours ferment together in a Vat for that purpose, close covered, which is said to enrich the Liquor.

Other Cider
Fruits.

The other sort of Fruits for the making of Cider, are the *Pepin*, *Pearmain*, *Gilliflower*, &c. by many preferred; with whom we may rank all sorts of Summer Apples, as the *Kentish Codling*, *Marrigolds*, all other sorts of *Pepins* and *Pearmains*, &c.

Which after they are through ripe, and laid on heaps to sweat (as before is directed) and grownd or beaten, and prest as the other; then is not this Cider or Must to be tunned up immediately, but suffered to stand in the *Vat* four and twenty hours or more, according as the Apples were more and less pulpy, and close covered with Hair-cloaths or Sacks, that too much of the spirits may not evaporate, nor be kept so closely in as to cause fermentation, in which time the more gross part of the feces will precipitate or fall to the bottom, which otherwise would have prejudiced the Cider by an over fermentation, and have made it flat and sour.

Then at a Tap three or four inches from the bottom of the Vat, draw

draw forth the Cider and tun it up, wherein is yet a sufficient quantity of that Gross *Lee* or feces to cause fermentation; the want of the right understanding whereof, is one of the main causes of so much bad Cider throughout *England*.

2. Of the Making of Perry.

Non omnis fert omnia tellus. In some places *Pears* will thrive Sorts of Pears. where *Apples* will not, the Trees are larger and bear greater quantities than Apple-trees: in *Worcester-shire* they have great plenty of *Pears* for *Perry*, and also in the adjacent Counties; The best for *Perry* are such that are not fit to be eaten, so harsh that Swine will not eat, nay hardly smell to them, the fitter to be planted in Hedge-rows, &c. the *Bosbury-Pear*, the *Horse-Pear*, the *Bareland-Pear*, and the *Choake-Pear*, are such that bear the name of the best *Pears* for *Perry*, the redder they are, the more to be preferred.

Pears are to be fully mature ere they be ground, and let ly on Making of Perry. heaps as the *Apples*.

Crabs and *Pears* ground together, make an excellent Liquor, the *Crabs* helping to preserve the *Perry*.

The method of making *Perry* differeth not from that of *Cider*.

3. Some Observations concerning Cider.

Thick *Cider* may by a second fermentation be made good and cleer, but acid *Cider* is rarely recovered.

Wheat unground about a gallon to a hogshead or *Leven*, or *Mustard* ground with *Cider*, or much better with *Sack*, a pint to a hogshead, is used either to preserve or recover *Cider* that's in danger of spoyling.

Ginger accelerateth the Maturation of the *Cider*, giveth it a more brisk spirit, helpeth fermentation, and promoteth its duration.

New vessels affect the *Cider* with an ill savour, therefore if you cannot obtain wine Cask, which are the best, nor yet can season your own with beer or other drinks, then scald it with water, wherein a good quantity of *Apple-Pounce* hath been boyled.

If the vessel be tainted, then boyl an ounce of Pepper in water, enough to fill the Vessel, and let it stand therein two or threedays.

Or take some quick Lime and put in the Vessel, which slacken with water close stop it, and tumble it up and down, till the commotion cease.

Two or three Eggs put into a *Hogshead* of *Cider* that is sharp sometimes lenifies it; two or three rotten *Apples* will clarify thick *Cider*.

The mildness and temperature of the weather is of much concernment in the fermentation of *Cider*.

Boyl *Cider* immediately after the Press, before Fermentation.

Wheaten bran cast in after fermentation, thickens the *Coat* or *Cream*, and much conduceth to its preservation.

The Cider that runs from the ground, or beaten Apples, before they are in the Press, is much to be preferred.

Let the Vessel not be quite full that there may be room for the Cider to gather a head or Cream.

Pearmains make but small Cider of themselves.

Bottling of
Cider.

Bottling is the onely way to preserve Cider long; It may be bottled two or three days after it is well settled, and before it hath thoroughly fermented; Or you may bottle it in *March* following, which is the best time.

Bottles may be kept all the Summer in cold Fountains, or in Cellars in Sand; If they are well corked and bound, they may be kept many years in cold places; the longer the better, if the Cider be good.

After Cider hath been bottled a week, (if new Cider, else at the time of bottling) you may put into each bottle a piece of white Sugar as big as a Nutmeg, this will make it brisk.

If your bottles be in danger of the frost, cover them with straw; about *April* set them in Sand, or in a Fountain.

4. Of the Wines, or Juices of other Fruits.

Cherry-wine.

If *Cherries* were in so great plenty that the Markets would not take them off at a good rate, they would become very beneficial to be converted into Wine, which they would yield in great quantity, very pleasant and refreshing, and a finer, cooler, and more natural Summer drink, than Wine; It may also be made to keep long: some hath been kept a whole year and very good. *Austen* of Fruit-Trees.

Wine of Plums.

Although it may not prove so brisk, clear, and curious a drink, as *Cherry-wine*, yet where *Plums* are in great plenty, (they being Trees easily propagated) a very good Wine may be made of them, according to the great diversity of this sort of Fruit, you must expect divers Liquors to proceed from them. The black tawny Plum is esteemed the best.

Mulberry-
wine.

This Fruit yields a good Wine being prepared by a skilful hand, the natural juice serves, and is of excellent use to add a tincture to other paler Wines, or Liquors.

Raspberry-
wine.

England yields not a Fruit, whereof can be made a more pleasant drink, or rather Wine, than of this humble Fruit; if compounded with other wines or drinks it amitates then with so high a fragrant savour and gust, that it tempts the most curious Palats.

Wine of Currants.

The small quantity of this Fruit prevents us from an experimental relation of the quantity of its juice, but its acid (though pleasant) taste gives us reason to judge it rather to yield a Verjuice than a Wine, but doubtless worthy our Cognizance.

As for any other Liquors, Preservations, or Conservations of these or any other Fruits, I leave you to the many Tracts published already on that subject.



C H A P. VIII.

Of such Tillage, Herbs, Roots, and Fruits, that are usually planted and propagated in Gardens and Garden-grounds, either for necessary Food, Use, or Advantage.

MOST of these several sorts of Tillage whereof we are now to treat in this Chapter, will raise unto the Industrious Husbandman an extraordinary Advantage, and are not to be esteemed amongst the least of Improvements; For each sort being properly planted in such ground they most naturally delight in, and being well Husbandried, and judiciously ordered, produce an incredible Advantage.

The Advantage of Garden Tillage in general.

But think not this strange that common and well known Plants, that are so natural to our English Soyl, should prove so beneficial, it is for no other cause than that some men are more Industrious and Ingenious than others; For these Garden-Plants prosper not without great labor, care, and skill, and besides are subject more than others to the injuries of unseasonable weather. Neither of which the sloathful or ignorant Husbandman can away with, affecting onely such things that will grow with least toyl, hazard, or expence, though they feed on Bread and Water, when the diligent and industrious Adventurer, lives like a Petty-prince on the fruit of his Labours and expectation, which sufficiently repays his expence and hazard; It is hard to finde any Trade, Occupation, or Employment, that a man may presume on a large and noble requitall of his time, cost, or industry, but it is hazardous, especially to such that attempt the same without a special affectation thereunto, or skill therein.

Nil tam difficile est quod non Solertia vincet.

So this Art and Employment of Planting, Propagating and Encreasing of Hops, Saffron, Liquorice, Cabbage, Onions, and other Garden Commodities, being Casual, and more subject to the injuries of the weather than commonly Corn or Grass is, makes it so much neglected; for one bad Crop or bad year for any of them, shall more discourage a Country man from a Plantation thereof, than five good Crops though never so profitable and advantagious shall incourage; Ignorant and self-willed men are naturally so prone to raise Objections on purpose to deter themselves and others from any thing whatsoever, that's either pleasant or profitable.

But we hope better of the Ingenious, that they will set to their helping hand, to promote this useful and necessary *Art*, and thereby become a provoking President to their ignorant Neighbours, that our Land may be a Land of Plenty, that it may superabound with necessaries, and rather afford a Supply to their Neighbours, than expect it from them, as we are enforced to do, in several sorts of those things we treat of in this Book; those of our own growth also far exceeding that we have abroad; which Inconveniencies and disadvantages nothing can better prevent than our own Industry and Ingenuity.

Sect. I.

Of Hops.

We mention this Plant in the first place, not for his Worth or Dignity above the rest, it being esteemed an unwholesome Herb or Flower for the use it is usually put unto, which may also be supplied with several other wholesomer and better Herbs, but for that of all other Plants it advanceth Land to the highest Improvement usually to forty pound, or fifty pound, sometimes to an hundred pound *per Acre*.

And yet have we not enough planted to serve the Kingdom, but yearly make use of *Flemish Hops*, nothing neer so good as our own. The principal cause I presume is, that few bestow that Labor and Industry about them they require, and sufficiently retalliate; for being managed carelessly, they scarce yield a quarter part of the increase, that those yield that are dexterously handled, though with very little more cost. Another cause is why they are no more propagated here, that they are the most of any Plant that grows subjected to the various mutations of the Air, from the time of their first springing, till they are ready to be gathered; over-much Drought, or Wet, spoyles them, Mill-dews also sometimes totally destroys them; which casualties happening unto them, makes their price and valuation so uncertain, and proves so great a discouragement to the Country man, else why may not we have as great a plenty of them, as in *Flanders, Holland, &c.* Our Land is as cheap, and affords as great a Crop (if as well husbandryed) and we pay not for carriage so far, but that they are more Industrious than us; Therefore seeing that is so gainful a Commodity to the Husbandman, and that there is a sufficient vent for them at home, we shall be the more prolix in the subsequent discourse.

Best Land and
situation for
a Hop-garden.

The Hop delights in the richest Land, a deep mould, and light, if mixed with Sand its the better, a black Garden mould is excellent for the Hop.

If it ly neer the Water, and may be laid dry, it is by much the better.

Most sorts of Land will serve, unless stony, rocky, or stiff clay Ground, which are not to be commended for the Hop.

If you can obtain it, a piece of Land a little inclining to the South,

South, and that lies low, the ground mellow and deep, and where Water may be at command in the Summer time, is to be preferred for a *Hop-garden*.

Also it ought to ly warm and free from impetuous Winds, especially from the *North* and *East*, either defended by *Hills* or *Trees*, but by *Hills* the best.

Every one cannot have what Land he pleaseth, but must make use of what he hath, therefore if your ground ly obvious to the Winds, it is good to raise a natural defence therefrom by planting on the edges of the *Hop-garden* a border or row of *Trees* that may grow tall, and break the force of the Winds at such time the Poles are laden with Hops; the *Elm* is esteemed not fit to be planted neer the Hop, because it contracteth *Milldews*, say our Countrey Hop-planters, the *Ash* on a dry ground, and the *Poplar* or *Aspen* on a moist, are to be preferred for their speedy growth; Also a tall and thick hedge of *White-thorn* keeps the ground warm, and secures it in the *Spring* from the sharp nipping Winds that spoyl the young Shoots.

Defending the
Hop-garden by
Trees.

Aspen.

If your Land be cold, stiff, sower, or barren, you design for a *Hop-garden*, the best way is about the latter end of the Summer to burn it, (as before we directed) which will be very available to the amendment of the Land; Some also prescribe to sow *Turpiss*, *Hemp*, or *Beans* therein to make the ground light, and mellow, and destroy the Weeds.

Preparing the
ground and di-
stance of the
Hills.

But in whatsoever state or condition your ground be, Till it in the beginning of the Winter, with either Plough or Spade.

And when you have set out the bounds of your ground you intend to plant, and laid the same even, then must you mark out the several places where each Hill is to be; the best way is by a line streightned overthwart the ground, with knots or thredstyed at such distance you intend your Hills; Some plant them in plain Squares *Checquer-wise*, which is the best way if you intend to plough with Horses between the Hills. Others plant them in form of a *Quincunx*, which is the more beautiful to the Eye, and better for the Hop, and will do very well where your ground is but small, that you may overcome it with either the *Breast-plough* or *Spade*, which way so ere it be, pitch a small stick at every place where there is to be a Hill, and when it is all so done, in case your ground be poor or stiff, bring into it of the best mould you can get, or a parcel of Dung and Earth mixed, and at every stick dig a hole of about a foot square, and fill it with this mould or Compost, wherein your Plants are to be set, they will thrive the better, and the sooner come to bear, and sufficiently repay your Charge and Trouble.

Great rarity there is both in the judgement and the practise of most men about the distance of the Hills, by reason of the different Seasons; Sometimes it falls out to be a moist year, and then the Hop growes large, and the wider the Hills are the better they prove; Some years also prove hot and dry, the Hops then grow thin, and the nearer they are the more Hops they have; But let

Distance of
the Hills.

me

me advise to keep a convenient distance that you may have room sufficient to come between, and ground sufficient to raise the Hills with the pearings or surface of it, and that the Sun may come between, and that the Poles may not be driven the one against the other with the Winds, when they are laden.

If your ground be dry and burning, about six foot may be a convenient distance, but if it be a moist, deep, and rich mould subject to bear large Hops, then eight or nine foot distance is most convenient, and so according to the goodness of the ground, place the distance of the Hills.

Bigness of the Hills.

But if your Hills are too far asunder, the best way to remedy that Inconvenience is by encreasing the number of Hops in the Root, in each Hill by which means you may apply more Poles, and supply the former defect; Hills may be made of that bigness that they may require six, ten, or twenty Poles; The common objection is, they cannot so conveniently be dressed, but I onely propose it as amendment to make them somewhat bigger than ordinary; Or if your Hills be too neer together, you may also abate the Hops and apply the fewer Poles, for over-poling of a ground as well in number as height, injures it more under-poling.

Time of planting Hops.

Authors and most *Practisers* usually advise to plant Hops in the end of *March*, or in *April*, but some of our best experienced Planters affirm it to be best in *October* before the cold Winter, and that then the Hops will settle against the Spring.

Choice of Sets and manner of setting.

Choose the largest Sets that you can get, which are to be had best out of a Garden well kept, and where the Hills have been raised very high the precedent year, which increaseth the Plants both in number and bigness, let them be as long as you can get them, about eight or ten inches may be of a very good length, and in each plant three or four Joynts or Buds.

Before you have your Sets out of the ground, make the Holes ready to put them in, if you can, else you must be forced to lay them in cold and moist Earth, and take them out as you have occasion to use them; dig your Holes according to the depth of your Plant eight, ten, or twelve inches deep, and about a foot over.

Some take two or three of the Plants and joyn the tops together, and set them bolt upright directly in the middle of the hole, holding them hard together with the one hand; while you fill the hole with the other, with fine mould prepared and made ready before-hand for that purpose; observing that you set the tops even with the surface of the ground, and the same end uppermost that grew so before, then fasten well the Earth about the Roots.

Others place at each corner of the hole a Plant, which way is to be preferred before the other.

It is convenient to raise the Earth two or three inches above the Set, unless you plant so late that the green Sprigs are shot forth, then you are not to cover them wholly, lest you destroy them.

Beware of wilde Hops, which are onely discerned by the Stalk and Fruit.

If

If your Hops be old and ill husbandried, or worn out of heart, then about the beginning of Winter dig them, and take away as much of the old barren Earth as you can, and apply good fat Mould or Compost, to their Roots; Or if you cannot conveniently, or think it not fit to do it before Mid-winter, yet neglect not to do it in *January* or *February* at the furthest, the weather being open; For such Winter dressing and renewing their Mould is a principal renovation to a decaying Hop: Or if your Hop-ground be full of *Weeds* or *Couch-grass*, such Winter digging of it destroys them.

But if your Hops be in good heart, and strong, then late dressing is most proper, which restrains them from too early springing, which is the cause of many injuries to the Hop, the onely time for such strong Hops, to be dressed in is *March*, some dress in the beginning of *April*.

In the dressing of Hops these rules are necessary to be observed; First, to pull down your Hills, and undermine them round about till you come neer to the principal Roots, and then take the upper or younger Roots in your hand, and shake off the Earth, which Earth being removed away, with your said tool you shall discern where the new Roots grow out of the old Sets; In the doing whereof be careful that you spoil not the old Sets, as for the other Roots that are to be cut away, you shall not need to spare them to the delay of your Work, except such as you mean to set.

Take heed that you uncover not any more than the tops of the old Sets in the first year of cutting, at what time soever you pull down your Hills cut not your Roots before *March*.

At the first dressing of young Hops, cut away all such Roots or Sprigs as grew the year before out of your Sets within one inch of the same; every year after you must cut them as close as you can to the old Roots, even as you see an *Osiers* head cut, say our Authors; But it is found experimentally to be advantageous to a weak Hop, to leave some principal new shoots at the dressing, and that the clean cutting off of them, hath very much decayed a Hop-garden.

The Roots that grow downward are not to be cut, but such that grow outward at the sides of the Plants may, else they will incumber the ground.

The old Roots are red, these of the last year white, if there be any wild Hops, you must take up the whole hill, and new plant it, marking the Hill with a stick at the Hop-harvest, to prevent mistakes.

When you have dressed the Roots, then apply of your rich Mould or Compost prepared for that purpose, and make the Hill not too high at first, lest you hinder the young Shoots, although the Hops be sprung out of the Hills, yet fear not the cutting of them off when you dress them.

Be sure to keep Poultry, and especially Geese, out of the Hop-garden, especially during the Spring.

Accord-

Of Poling the
Hops.

According to the distance of your Hills, and nature of the Ground, provide the number of your Poles, and according to the strength of the Hop, the length or bigness.

If the Hills be wide, the more Poles, sometimes four or five to a Hill: if the Hills are neer, then two or three may suffice: in hot, and dry, and hungry Ground the Poles may stand neerer than in rich, mellow Land, where they are more subject to grow grosse and hawmy.

Also if your Hops be strong, and Ground rich, provide large Poles either in bigness or in length, or else you loose the best of your profit for want of Poles; but if they are poor, provide but small Poles, lest you impoverish the Root; for the Hop will soon run it self out of heart, if over-poled, more especially be sure not to over-pole Hops the first year of their Plantation, although they require as many Poles, (or rather Rods) the first as any other year.

You must be content with such Poles the Country you live in affords, *Alder*-poles are esteemed the best, because the Hop most willingly climbeth them, by reason of their streight and tapering form, and also their rough Rinde, which suffers not the Hop so easily to slip down.

But the *Asb* is esteemed the best for lasting, especially such that grow on dry, and barren Lands of many years growth, which are known by the many Circles in the bottom; I have known such to have last ten or twelve years, the wood being much harder and more durable than the speedy grown Poles.

Some altogether reject forked Poles, and usually cut off the forked branches, if any, because they cannot (as they pretend) so easily strip off the Hops at gathering time, but I have known the greatest burthen of Hopson a forked Pole, and to have suffered less injury by the Winds when they have been fully blown, and that inconveniency of not stripping them, is easily remedied by our directions, as you will hereafter finde.

Disperse the Poles among the Hills before you begin to pole, laying of them between the Hills.

Begin not to Pole until your Hops appear above the ground, that you discern where the biggest Poles are required, and so may you continue poling till they are a yard in height or more; but stay not too long lest you hinder the growth of the Hop, which will grow large unless it hath a Pole or such like to climb unto.

Set the Pole neer to the Hill, and in depth according to the height of the Pole, nature of the ground, and obviousness to Winds, that the Pole may rather break than rise out of the ground by any fierce Winds.

Let the Poles lean outward the one from the other, that they may seem to stand equi-distant at the top, to prevent housling as they term it, which they are subject unto if they grow too neer the one from the other, that is, they will grow one amongst another, and cause so great a shade that you will have more Hawm than Hops; Also it is esteemed an excellent piece of husbandry to set
all

all the Poles inclining towards the South, that the Sun may the better compass them; this is most evident, that a leaning or bending Pole bears more Hops than an upright,

Be sure to reserve a parcel of the worst Poles, that you may have for your need, in case, when the Poles are laden, a Pole may break, or be over burthened, to support it, for if they ly on the ground, they soon perish.

With a rammer you may ram the Earth at the outside of the Pole, for its further security against Winds.

If after some time of growing, you finde a Hop under or over poled you may unwind the Hop, and place another Pole in its place, having a Companion with you to hold the Hop, whilest you pitch in the Pole; Or else you may place another Pole neer it, and bring the Hop from one Pole to the other.

The next work is after the Hops are gotten two or three foot out of the Ground, to conduct them to such Poles as you think fit, that are either nearest or have fewest Hops, and winde them or place them to the Pole, that they may winde with the course of the Sun, and binde them gently thereto with some withered Rush, or woollen Yarn, two or three strings are enough to a Pole, I have known more Hops on a Pole from one string, than from four or five; though there hath been more of Hawm.

*Of tying of
Hops to the
Poles.*

Be cautious of breaking the tender Shoots, which in the morning is most dangerous, but when the warmth of the day hath toughened them, may it much better be done.

You must be daily amongst the Hops during *April* and *May* especially, guiding and directing them, else will they be apt to break their own necks by going amiss, it will sufficiently requite your labor and care, at harvest.

It is convenient with a forked Wand to direct the Hops to the Poles that are otherwise out of reach, or to have a stool to stand on, or a small ladder made with a stay on the back of it, that you may reach them with your hands.

About *Midsummer*, or a little after the Hop begins to leave running at length, and then begins to branch that such Hops that are not yet at the tops of the Poles, 'twere not amiss to nip off the top, or divert it from the Pole, that it may branch the better, which is much more for the encrease of the Hop, than to extend it self only in length,

Sometimes in *May* after a Rain, pare off the surface of the ground with a Spade, how it off with a How, or run it over with a Plough with one Horse if you have room enough, or with a Breast-plough, and with these parings raise your Hills in height and breadth, burying and suppressing all superfluous Shoots of of Hops and Weeds.

*Of the making up the
Hills.*

By this means you will destroy the Weeds that otherwise would beggar your Land, and you suppress such Suckers and Weeds that would impoverish your Hops; and you also preserve the Hills moist by covering them, that the drought of the Summer injureth them not, also the Hop so far as it is covered with Earth;

issues forth its Roots, to the very surface of the Earth, which proves a very succour to the Hop; This work may be continued throughout the Summer, but more especially after a Rain, to apply the moist Earth about the Roots of the Hop.

Therefore it behooveth you to keep the ground in good heart, for this purpose, that your Hops may be the better, and in case it should prove a very dry Spring, it would not be amiss to water the Hops, before you raise your Hills.

Manner of
watering
Hops.

A dry Spring, such that happened in the years 1665. and 1667. proves a great Checque to the Hop in its first springing, especially in hot and dry grounds. In such years it is very advantageous to water them if it can with conveniency be obtained, either from some Rivulet or Stream running through, or neer your Hop-garden, or from some Well digged there, or out of some Pond made with Clay in the lower part of your Ground, to receive hasty showers, by small Aquaducts leading unto it, which is the best water of all, for this purpose.

In the midst of every Hill make a hollow place, and thrust some poynted Stick or Iron down in the middle thereof, and pour in your water by degrees, till you think the Hill is well soaked, then cover the Hill with the parings of your Garden as before we directed, which will set the Hop mainly forward, as I have known, which otherwise would be small and weak, and hardly ever recover to attain its usual height; Also a very hot and dry Summer, will make the Hop blow but small and thin, therefore would it not be labor lost to bestow a pail of water on every Hill, prepared before hand to receive it.

For in such dry Springs or Summers, such Hops that either stand moist, or have been watred, do very much outstrip their neighbours, and in such years they will far better requite your labor and Industry, yielding a greater price by reason of their scarcity, than in other seasonable years, when every ground almost produceth Hops: Industry and Ingenuity in these affaires being most encouraged, and best rewarded, at such times when ignorance and sloth, come off with loss and shame.

After every wating (which need not be above twice or thrice in the dryest Summers, so that they be thoroughly wet) be sure to make up the Hills with the Parings, and with the Weeds and coolest, and moistest materials you can get; for the more the Hop is shaded at the Root from the Sun, the better it thrives, as is evident by such that grow under shelter that are never drest, yet may compare with those you bestow most pains and skill on.

The dressing of your Hops, and poling them, the directing, and binding them to the Poles, the wating and making up the Hills throughout the Summer, seems to be a tedious task, requiring daily attendance; But without these Labours little is to be gotten, which makes this Plantation so little made use of in some places, yet he that is diligent and understands his business is so highly requited for his care, cost, and industry, that an Acre or two of ground so managed by one or two persons, shall redound one year

year with another to more advantage than fifty Acres of Arable Land, where there is much more time, cost, and expence bestowed on it.

Towards the end of *July Hops blow*, and about the beginning of *August* they *bell*, and are sometimes ripe in forward years at the end of *August*, but commonly at the beginning of *September*. *When Hops blow, bell, and ripen.*

At such time as the Hop begins to change his colour and look a little brownish, or that they are easily pulled to pieces, or that the Seeds begin to change their colour towards a brown, and they smell fragrantly, you may conclude them to be ripe, and procure what help is necessary for a quick dispatch, to gather them before they shatter, one windy day or night may otherwise do you much injury. *When to gather Hops, and the manner how.*

The manner usually prescribed for the gathering of Hops, is to take down four Hills standing together in the midst of your Garden, cut the Roots even with the ground, lay it level, and throw water on it, tread it and sweep it, so shall it be a fair Floor, whereon the Hops must lie to be picked.

On the outside of this Floor are the Pickers to sit and pick them into baskets, the Hops being stript off the Poles and brought into the Floor.

Some there are that sit dispersedly, and pick them into baskets, after they are stript off the Poles.

Remember always to cleer your Floor twice or thrice every day, and sweep it clean every such time, before you go to work again.

In these ways of picking it is necessary that the Poles be streight without forks, scraggs, or knobs.

But the best and most expeditious way is to make a Frame with four short Poles or Sticks laid on four forks driven into the ground, of that breadth to contain either the hair of your Oost, or Kilin, or a Blanket tacked round the same about the edges, of which Frame you may lay your Poles with the Hops on them, either supported with forks, or with the edges of the Frame, the Pickers may stand round and pick into it; when the Blanket or hair is full untack it, carry it away and place another, or the same emptied in the same Frame again; every day you may remove your Frame with little trouble to some new place of your Garden neer your work.

This way is found to be most convenient, expeditious, and advantageous, for it saves the labour of stripping the Hops of the Poles, also any forked or scraggy Poles which are best for the Hop, prove no impediment to this way of picking; It preserves the Hops from briting or shedding, which by shaving of the poles, and wrapping them up in bundles to carry up and down, they are apt to do; also this way they may pick them clean off the Poles as they hang, without tumbling and tearing, which causes much filth to mix with the Hops, besides the spoyling and loss of many Hops, and being thus picked over your Frame, if the Hops be never so ripe and subject to shatter, all is preserved. The Pickers

may this way also make more expedition than the other, the Hops hanging in view as they grew on the Poles.

Before you draw your Poles, with a sharp hook fixed at the end of a long Stale or Pole, divide the Hops above where they grow together with other Poles, then ought you to cut the Hops not as is usually prescribed and practised close at the Hills, but about two or three foot above the Hills, else will the Hop bleed much of his strength away; this hath been found to be a great strengthner of weak Hops, the other a weakner to all.

Then draw your Poles, which in case they are so far or fast in the ground, that you cannot raise them without breaking of them, you must get a pair of Tongs made like unto a Blacksmiths Tongs, onely stronger, and toothed at the end, with which Tongs you may Beclip the Pole at the bottom, and resting the joynt thereof on a block of wood, you may weigh up the Pole without trouble or danger of breaking the Pole: Or for cheapness sake, you may have a wooden Leaver forked at the end, in which fork fix two sides of sharp and toothed Iron, which put to the Pole and on a block of wood, as before, you may heave up the Pole, by the strength of your right hand, whilst you pull the Pole to you with your left.

Cut no more Stalks, nor draw no more than you can conveniently dispatch in an hour or two, in case the weather be very hot, or it be likely to rain.

If your Hop-garden be large, it were worth your cost and pains to raise in the midst thereof a Shed, or such like house, on four or six main Forks or Posts, and thatched over, under which Shelter you may pick your Hops, which will both defend your Pickers from the Sun, and your Hops from the Sun and Storms; herein also may you lay a parcel of Hops unpicked over night, that your Pickers may to work in the next morning, before the dew be off the other that are abroad; Or in case a Storm comes you may lay in here enough to serve till the other are dry again; Under this shelter also may your Poles lie dry all the Winter.]

Let not your Hops be wet when you gather them, but if the Dew be on them, or a Shower hath taken them, shake the Pole, and they will be dry the sooner.

If your Hops be over ripe they will be apt to shed their Seed, wherein consisteth the chiefest strength of the Hop; Also they will not look so green, but somewhat brown, which much diminisheth the value of them; yet some let them stand as long as they can, because they waste less in the drying; four pounds of undried Hops through ripe, will make one of dry, and five pounds of Hops scarcely ripe, yet in their prime, makes but one; So they judge they get more in the through-ripe Hop by the weight, than they loose in the colour.

There are also two sorts of Hops, the green and the brown, the one yielding a better colour by much when they are dry, the other bears larger and a greater quantity of Hops, which is rather to be preferred.

In the picking, keep them as clean as you can from Leaves and Stalks, which will damage you more in the Sale, than they will advantage you in the weight.

As fast as you pick them, dry them, for their lying undried heats them, and changes their colour, very much to the damage of the Hop; but if your Kiln be full and that you must keep your Hops a while, then spread them on some Floor, that they may not lie too thick, and thus will they keep a day or two without much damage.

*Of the drying
of Hops.*

Well drying of a Hop, is the most necessary thing to be taken care off, for if that be not rightly done, they are not fit for the Market, nor for use; for a handfull of slack dried Hops will marr, and spoyle many pounds, taking away their pleasant scent and colour; Therefore let your Hops be thoroughly and evenly dried, which to accomplish there are several ways made use of; Some whereof that are most useful, and necessary I shall here discover.

This following Description we finde to be used by the *Flemings, or Hollanders*, and also at *Poppering*.

*Description of
an Oost or
Kiln.*

First make the square Room or Kiln, above eight or ten foot wide, according as you desire it to be in bigness, built up with Brick or Stone, with a door-place at one side thereof.

In the midst of this Room on the Floor, must the fire-place be made, about thirteen inches wide within, and about thirty inches high in length from the mouth thereof, almost to the back part of Kiln or Oost, leaving onely a way for a man to go round the end of it, it is usually called a Horse, and is commonly made in Malt-kilns, the fire passing out at holes on each side, and at the end thereof, and needs no farther description, every Mason or Bricklayer almost is acquainted with it.

About five foot high is placed the Bed or Floor whereon the Hops lie to be dried, which must have a wall about it four foot high, to keep the Hops up from falling, at the one side of the upper Bed must be made a Window, to shove off the dried Hops down into the Room prepared for them.

The Bed must be made of Laths or Rails sawn very even, an inch square, and laid a quarter of an inch asunder, with a cross Beam to support them in the middle, into which Beam the Laths are to be let in even with the top of it, which keeps the Laths even in their places.

On this Bed without any Oost-cloath lay your Hops by basket-fulls, beginning at the one end, & so proceeding till all be cover'd about half a yard thick, without treading on them, then lay them even, with a Rake or Stick, that they may not lie thicker in one place than in another.

Then make your fire below, of broken Poles or other wood, say our Authors: but Charcoal is the onely Fewel for Hops, not in any wise diminishing the colour, which smoaky wood or brands will do.

You must keep your fire at a constant heat, onely at the mouth
of

of the Furnace, the Air will disperse it sufficiently.

The Hops this way are not to be stirred until they are thoroughly dried, which is not until the top are dry as well as the bottom; but if any place be not so dry as the rest, (which you may perceive by reaching over them with a stick or wand, and touching them in several places, observing where they rattle, and where not) then abate them there, and dispose of them where the places were first dry.

When they are all through dry, which is known by the brittleness of the inner stalk, if rubbed and it break short, then are they enough; then take out the fire, and shove out the Hops at the Window for that purpose, with a Coal rake made of a Board at the end of a Pole, into the room made to receive them, then go in at the door below, and sweep together the Seeds and Hops that fell through, and lay them with the other.

Then proceed to lay another Bed of green Hops, as before, and renew the fire.

*Another way
to dry Hops.*

In several places they dry their Hops on the ordinary Malt kilns, on a Hair-cloth, laying them about six inches thick, and when they are almost dry, with a Scoop made for that purpose, they turn them up-side down, and let them lie again till every Hop as neer as they can, be thoroughly dried, and then with the Hair-cloth remove them to the heap where they are to lie till they are picked.

Both these ways are subject to several inconveniencies; in the first way the Hops lying so thick and never turned, the under part of them must needs be dry long before the upper, and the fire passing through the whole Bed to dry the uppermost Hop, must needs over-dry, and much injure, and waste the greater part of the Hops, both in strength and in weight, besides the waste of firing, which must be long continued to through dry so many together.

In the second way, the turning of the Hops breaks them very much by forcing the Scoop against the rough Hair-cloth, frets and spoils many Hops, and shatters their Seeds, else this way is rather to be preferred above the other.

*The best way
to dry Hops.*

Which several inconveniencies may be removed and prevented, by making the lower part of the Kiln as before is described, and the Bed thereof made after the following manner: first, make a Bed of flat ledges about an inch thick, and two or three inches broad, sawn, and laid a cross on the other, Checquer-wise, the flat way the distances between about three or four inches, the ledges so entred the one into the other, that the Floor may be even and smooth; this Bed may rest on two or three joyses set edge-wise to support it from sinking.

Then cover this Bed with large double Tinn soudred together at each joynt, and so order the Ledges before you lay them, that the Joynts of the Tinn may always lie over the middle of a Ledge; and when the Bed is wholly covered with Tinn, fit Boards about the edges of the Kiln to keep up the Hops, onely let the one side be to remove, that the Hops may be shoved off (as before.)

On

On this Tinn Floor or Bed may the Hops be turned without such hazard or loss, as before on the hair, and with less expence of Fewel; Also any manner of Fewel will serve for this purpose as well as Charcoal, the smoak not passing through the Hops as in either of th'other ways: but you must remember to make conveyances for it at the several corners and sides of your Kiln or Oost.

Onely the saving of Fewel besides, the advantage your Hops receive, will of it self in a little time recompence the Charge extraordinary in making the Tinn Floor.

The turning of Hops after the most facile, and secure way, is yet found to be not onely a waste and injury of the Hop, but also an expence of Fewel and time, because they require as much Fewel, and as long time to dry a small part when they are turned, as if they were almost all to be dried, which may be prevented in case the upper-bed whereon the Hops lie, have a Cover made that may be let down and raised at pleasure, which cover may be Tinned over, onely by nailing single Tinn over the face of it, that when the Hops begin to be dry, and ready to turn, that is, that the greatest part of the moisture be evaporated away then may you let down this Cover within a foot or less of the Hops, which (Reverberatory like) will reflect the heat upon them; that the uppermost Hop will soon be as dry as the lower, and every Hop equally dried.

To dry Hops suddenly without turning them.

This is the most expeditious, most sure, and least expensive way that can be imagined to dry Hops, which is one of the costliest, troublesome, and most hazardous piece of work that belongs to the Hop, as it is vulgarly used.

As soon as your Hops are off the Kiln, bag them not immediately, but lay them in some room, or place, that they may lie three or four weeks or more, that they may cool, and give, and and toughen; for if they are immediately bagged, they will break to a powder, but if they lie a while (the longer the better so they be close covered from the Aire with blankets) you may pack or bag them with more security.

Bagging of Hops.

The manner whereof is usually thus; Make a hole round or square in an upper Floor, big enough that a man may with ease go up and down, and turn and wind in it, then tack on a Hop about the mouth of the Bag, fast with packthread that it may bear the weight of the Hops when full, and of the man that treads them, then let the Bag down through the hole, and the Hop will rest above, and keep the Bag from sliding wholly through, into which Bag cast in a few Hops, and before you go in to tread, tie at each lower corner a handfull of Hops, with a peice of packthread to make as it were a tassell, by which you may conveniently lift or remove the Bag, when he is full; then go into the Bag and tread the Hops on every side, another casting still in as fast as you require them till it be full; When it is well trodden, and filled, let down the Bag by unripping the hoop, and close the mouth of the Bag, filling the two upper corners as you did the two lower.

Which

Which Bag if well dried, and well packed, may be preserved in a dry place several years, but beware lest the Mice destroy and spoyle them.

Laying up the Poles.

After you have dried and laid by your Hops, you may return again to the Hop-garden, and take care to preserve the Poles for another year.

Strip off the Hawm clean from them, and set up three Poles (like unto a Triangle, wherewith they usually weigh heavy ware) spreading at the bottom, and bound together neer the top, about which you may set your Poles as many as you please, binde them about with a little Hawm twisted, to keep them together: By this means the outward Poles onely are subject to the injuries of the weather, which keep all the inner Poles dry, except onely the tops, which for the most part are exposed to the Ayr and wet.

Therefore the most part pile them up at length in Piles in several places of the Hop-garden, by pitching in several Poles on each side the Pile, and laying two or three old Poles athwart at the bottom to keep them from the moist ground, and so lay the Poles that the smaller ends may be inwards, and the bigger ends outwards; for which purpose the Pile must be made somewhat longer than the Poles; and when you have raised them high enough, with ropes of Hawm binde the Poles that stand on the one side overthwart to the Poles on the other, to preserve them upright, and cover them with Hawm, to defend them against the Rain.

But the better way is to lay them in such Shed or House erected in your Hop-garden, which may serve for picking of Hops therein the Summer, and preservation of the Poles in the Winter; it will soon requite your cost.

Dunging or Soyling of the Hop-garden.

In the Winter when little else can be done to the Hop-garden, then may you provide Soyl and Manure against the Spring; if the dung you carry in be rotten, then mix it with two or three parts of the common earth, and so let it lie well mixed till the Spring, which will serve to make up the Hills withal.

But if the Dung or Soyl be new, then let it lie mixed till another year, for new Dung is very injurious to Hops.

Horse-dung, Cow-dung, or Ox-dung are very good, but no dung is to compare with Pigeons-dung, a little thereof onely to a Hill, and mixed that it may not be too hot in a place; Sheeps-dung also is very good.

In the Spring or Summer time, if you steep Sheeps-dung, Pigeons-dung, or Hen-dung in water till it be quite dissolved, and when you water your Hops on the top of every Hill in the hollow place made to contain the Water, you may put a dishful of this dissolved dung, and the water wherewith you water your Hops, will carry with it the vertue thereof to the Roots of the Hop, which may prove the most expeditious, advantagious, and least expensive way of enriching the Hop-hills of any other.

Also by this means you may convey to the Roots of Hops, or any other Plant, the fixed Salt, or vertue of Lime, Ashes, or any other

other fertilizing or enriching subject whatsoever, whereof we have already discoursed.

Sect. 2.

Of Liquorice, Saffron, Madder, and Dyars Weed.

The Land this Plant principally delights in, being not every where to be had, is one of the causes it is so much neglected, and the method of planting and ordering of it so little understood, although our English *Liquorice* exceeds any forreign whatsoever, yet have not we enough planted, but yearly buy of other Nations.

It much delights in a dry and warm Land, light and mellow, and very deep, for in the length of the Root consists the greatest advantage, for if it be not light, dry, and deep, the Roots cannot enlarge freely; such Land that Carrots, Parsnips, &c. delight in, *Liquorice* will prosper in it; If the ground be not very rich of it self, you must mix good store of the best and lightest Soyl in the digging, it must be trenched very deep, at the least three Spades deep, in case the mould will bear it, and lay it as light as possibly you can: The best way is to dig it with the dung at the beginning of the Winter, and then dig it again at planting-time, which will lay it much the lighter, and mix the dung the better.

Procure your Sets from the best and largest *Liquorice*, the best Sets are the Crown sets or heads got from the very top of the Root; Next, and neer as good are the Runners, which spread from the Master Roots, and have little Sprouts and Roots, which will make excellent Sets, being cut about four or five inches long. The branches also may be slipped and planted, if it prove moist weather, they will many of them grow, these may serve to thicken where they are too thin.

The usual and best time for the planting of *Liquorice*, is in February and March, about a foot distance is usual to plant your Sets, in rows by a Line, in holes made with a Setting-stick, deep enough to contain the Plant, which as soon as it is in the hole, earth it up; and if they prove dry, water them as soon as they are set, and so for several days, until they have recovered their witheredness; the first year you may sow the ground with Onions, Lettice, or such like Herbs.

Then afterwards they must be kept howed every year, till they are taken up.

The Sets are impatient of being planted after they are once out of the ground, therefore use what expedition you can, and Earth them up if you carry them far, and be sure to have the ground ready before the Sets.

After it hath stood three Summers in the Ground, you may dig it up, about the month of November or December, for then it weighs most, and will keep best without loss for some time; It is best to dispose of it whilest it is new and green, because it will much decay in its weight.

Some that have very good Liquorish have gained much by it,

the better the Land is, the more is the advantage; there hath been made from fifty pound to an hundred pound of an Acre, as some affirm.

Improve-
ment.

Pontefract in *York-shire* is the most noted place for this Plant that I have heard of; next unto that *Godalming* in *Surry* deserves to be remembred also; for the Industry of the Inhabitants in propagating this necessary Plant; The long continuance of the planting, whereof in those places to the so great advantage of the Inhabitants, is an Argument sufficient of the Improvement it makes, there being in many other places as good Land for this purpose, as either of those places afford.

Of Saffron.

what Land is
best for Saffron.

English *Saffron* is esteemed the best in the world, its a Plant very suitable to our Climate and Soyl, therefore it is our negligence that it is no more propagated, it delights in a good, dry, sound Land brought into perfect Tillage by Manure and good Husbandry; the better your Land is, the better may you expect your Crop; About *Midsummer* it is to be planted, some say about *March*, it is encreased by the Roots which yearly multiply in the ground, like unto other bulbous Roots, or rather more; they are to be taken up and new planted usually once in three years, and then may many of the Roots be obtained, they are set in Ranges two or three inches deep, and about two or three inches asunder, but the Ranges about four or five inches apart, for the more convenient weeding or howing of them.

Time of the
flowering and
gathering of
Saffron.

About *September* the Flower appears like a blew *Crocus*, and in the middle of it comes up two or three Chives which grow upright together, and the rest of the Flower spreads broad, which *Chives* being the very *Saffron* and no more, you may gather betwixt your fingers and reserve it; this must be done early in the morning, else it returns into the body of the Flower again; and so for about a months space may you gather Saffron. You must procure many hands according to the quantity of your ground, you may gather two or three Crops and then remove it. After it hath done flowering it remains green all the Winter.

Drying of
Saffron.

Care must be also taken in the drying of it, which may be done in a small *Kiln* made of Clay, and with a very little fire, and that with careful attendance, three pound thereof moist usually making one of dry.

Profits of Saffron.

1 Acre may bear from seven to fifteen pound, and hath been sold from twenty shillings a pound to five pound a pound, and may cost about four pound per Acre the management thereof, which gives a very considerable Improvement and Advantage.

Of Madder.

This is esteemed by some to be a very rich *Commodity*, and worthy our care and cost to propagate it, being so much used by *Dyers* in the dying of their red colours, and in so great request of the *Apothecaries* for medicinal uses, and a Plant also that delights in our Climate.

Land fit for
Madder.

It is to be planted in a very rich, deep, warm, and well manured Land digged at least two or three Spade graft deep.

Time and man-
ner of planting
it.

Then about *March* or *April* as soon as it springs out of the ground,

ground, is it to be planted, the Sets are to be gathered two or three inches long, with Roots to them, and immediatly planted or put into mould, if carried far, and then set about a foot apart the one from the other, and kept watered till they spring, and continually weeded till they have got the Mastery of the Weeds.

At three years end you may take it up, reserve the *Plants* for your own use, and sell the *Roots* to the *Apothecarys*, or dry them for the *Dyers* use; But the Description and *Manner of drying and Milling* thereof for that purpose, I leave to those that are better experienced therein, or until I have obtained some light thereunto; the great advantage that it brings to the Planter, according as it is by some related, is encouragement sufficient to any Ingenious man to make a farther enquiry, and progress into its nature and method of ordering it.

The use and profit of Madder.

This is a rich *Dyers* Commodity, it groweth in many places wilde, and is sown also in many places in *Kent* to a very great advantage, it will grow on any ordinary or barren Land, so that it be dry and warm.

Of Wild, or Dyers Weed. what Land it requires.

It may be sown on Barly or Oats after they are sown and harrowed, this requiring onely a bush to be drawn over it, a gallon of Seed will sow an Acre, it being very small, and is best to be mixed with some other material, as before we advised concerning *Clower-grass seed*, it groweth not much the first Summer, but after the Corn is gathered, it is to be preserved, and the next Summer you shall receive your Crop.

Manner of sowing it.

You must be very cautious in the gathering of it, that the Seed be not over ripe, for then will it fall out, if not enough, neither Seed nor Stalk will be good; It is to be pulled as they do Flax, by the Roots, and bound up in little handfulls and set to dry, and then housed; then may you beat or lash out the Seed which is of good value, and dispose of the Stalk and Root to the *Dyar*, which is of singular use for the *dying* of the bright Yellow and Lemon Colour.

Gathering and ordering of it.

Seet 3.

Of Beans, Pease, Melons, Cucumbers, Asparagus, Cabbage, and several other sorts of Garden-Tillage.

Of Beans in general we have already discoursed in this Treatise, onely here as it falls in our way, we shall say a little concerning the greater sort of Garden-beans, which you plant onely for the Table; They delight in a rich, stiff Land, or any Land new broken up, they are usually set between *St. Andrews-day* and *Christmas*, at the wane of the Moon; But if it happen to freeze hard after your Bean are spired, it will go neer to kill them all, therefore it is the surest way to stay till the greatest Frosts are over, until after *Candlemas*: It is a general Errour to set them promiscuously and too neer together, when it is most evident that being set or otherwise planted in Rows by a Line, they bear much more, the *Sun* and *Air* having a more free passage between them; also you may the better go between them to

Garden beans.

weed, top, or gather them; also you may sow Carrots in the intervals, which after the Stalks are drawn up will prove a good second Crop, let the Ranges run from *South* to *North*, for the greater advantage of the *Sun*.

If you sow or plant them in the *Spring*, steep them two or three days in fat water, as before is prescribed for the steeping of Corn, it is better to *bow* them in, than to set them with *Sticks* the usual way; in the gathering of green Beans for the Table, the best way is to cut them off with a knife, and not as is usual to strip them down; for that wound prevents the prosperity of the younger *Cods*, not yet ripe, when you have gathered your early Beans, then cut off the stalks near the ground, and you may probably have a second Crop ere the Winter approach; These larger sort of Beans yield a far greater encrease than the ordinary sort, therefore it is great pity they are no more propagated in the Fields, than they are, especially where the ground is rich,

Of Pease.

There are several sorts of Garden-pease sown or planted in this Kingdom, some approved of for their being early ripe, and some for their pleasant taste, others for their being late ripe succeeding the other; the Hot-spurs are ripe the soonest from their time of sowing of any other, then succeeds the large white Pease, and several other sorts of green, gray, and white Pease, then the large white *Hasting*, and great gray rouncival Pease; There is also another sort of Pease in some place, usually called the Sugar-pease, for their sweetness, they are to be eaten in their *Cods*, which grow crooked and uneven, their extraordinary sweetness makes them lyable to be devoured by the Birds unless you take great care to prevent them, these are sown later than the other by reason of their tenderness.

A fat rich Garden-mould yields the largest Pease, but a light, warm, and ordinary Soyl, yields the tenderest and sweetest.

If you would have the earliest Pease, sow them in *September* or *October*, that they may get some head before the Frosts take them, and then with due care may they be preserved over the winter, and will bear very early, also to have them very late, sow them a little before *Midsummer*, and so may you have Pease in *September*.

As for the manner of sowing it is divers, some sow at randome, as they sow Corn, which is altogether to disapproved of, because they cannot be so evenly dispersed, nor at so equal a depth, as in th'other ways; Others set them in Ranges with a Dibble or Setting-stick, which is a very excellent way both to save Pease, and to give liberty to pass between for the *howing*, *gathering*, &c. But that which is most used, and best approved of, is the *howing* of them in, which makes a quick riddance of the work, and covers all at a certain depth, and doth not sadden or harden the ground, as setting doth.

It is good to make the Ranges at some reasonable distance, that you may the more conveniently pass between them, to *bow* the Weeds, and earth up the Roots in the *Spring*, for the nakedness and barrenness of the ground, adds much to the maturation of the Pease,

Pease, by the reflection of the Sun, and the laying up the Earth at the Roots preserves them much from Drought.

Where your ground is small, or that you can easily furnish your self with *sticks*, they will yield a greater encrease if they have *sticks* to climb on: But this and several other ways of ordering them, we leave to the pleasure and skill of every one, whose curiosity and delight is exercised in such affairs.

Of all the sorts of *Codware* there is none so fruitful, nor multiplies so much as doth the *French* or *Kidney-bean*, being also a very pleasant, curious and wholesome food, and deserves a greater place and proportion of Land in our Farm, than is usually given it, it is a Plant lately brought into use among us, and not yet sufficiently known, the greatest impediment to its farther propagation is the tenderness of it at its first springing, and the sweetness in it, which makes it more lyable to be devoured by Snayls, Worms, &c. But a little care and industry bestowed about them, will be plentifully recompensed in the fruitful Crop, the several uses whereof as well for the *Kitchen*, as for the feeding of *Beasts* and *Fowl*, are not yet commonly known or practised.

Of French-Beans.

These being meerly Fruits raised for our pleasure in the Summer time, and not of any general use nor advantage to the Husbandman, we shall therefore pass them by, onely as to the ordering of the ground, for the setting and raising them early, see more at the end of this Chapter.

Of Melons and Cucumbers.

The best way for the raising of *Pompions* is to plant the Seeds first in a good mould, in a warm place, and then to transplant them into a rich dungy Bed made for that purpose, watering them now and then with water wherein *Pigeons-dung* hath been infused, then take away about blossoming time all the by-shoots, leaving onely one or two main runners at the most, and so shall you have them grow to an huge bigness. Take heed you hurt not the heads of the main runners.

Of Pompions.

The *Artichok* is one of the most excellent Fruits of the *Kitchen-garden*, and recommended not onely for its goodness, and the divers manners of *cooking* of it, but also for that the Fruit continues in season a long time.

Of Artichocks.

The ground is to be very well prepared, and mixed several times with good dung and that very deep, the *Slips* that grow by the sides of the old *Stubs*, serve for plants, which are to be taken and planted about *April*, when the great *Frosts* are over, and kept watered till they are firmly rooted, and if they be strong they will bear heads the *Autumn* following; they are to be planted four or five foot distance the one from the other if the *Soyl* be rich, but if it be not, then neerer; After the *planting* they need no other culture before Winter, save onely weeding, and dressing sometimes.

Against the *Winter*, before the great *Frosts*, they are to be preserved against them; Some cut the leaves within a foot of the ground, and raise the Earth about them, in manner of a Mole-hill within two or three inches of the top, and then cover it with

Preservation against Frosts.

Long.

Long-dung, which both preserves them from *Frosts*, and keeps the Rain from rotting them.

Others put *Long-dung* about the Plants, leaving the Plant a little breath-room in the middle, which will also do very well.

Others prescribe them to be covered with an *Earthen-pot*, with a hole at the top, but a *Bee-hive* is to be preferred before it.

It is not good to *earth* too soon lest it rot them.

Dressing Arti-
choaks.

The *Winter* spent, you shall uncover your *Artichokes* by little and little, at three several times, which about a four days interval each time, lest the cold *Ayr* spoyle them, being yet tender, you shall then *dress*, *dig* about, and trim them very well, discharging them from most of their *small slips*, not leaving above three of the strongest to each foot for bearers, and give a supply to the *Roots* as deep as conveniently you can, of good fat mould.

It will be good to renew your whole *Plantation* of *Artichokes* every *fifth* year, because the Plant impoverishes the Earth, and produces but small Fruit.

If you desire to have *Fruit* in *Autumn*, you need onely cut the *Stem* of such as have born *Fruit* in the Spring, to hinder them from a second *Shoot*, and in *Autumn* these lusty *Stocks* will not fail of bearing very fair *Heads*, provided that you *dress* and *dig* about them well, and water them in their necessity, taking away the *Slips* which grow to their *Sides*, and which draw all the substance from the Plants.

Of Aspara-
gus.

This Plant seems to contend for preheminance, with any of the *Garden* Plants for the Kitchen, being so delicate, and wholesome a food, coming so early, and continuing so long, as to ulsher in many other of the best rarities.

Planting of
them.

They are raised of *Seeds* in a good fat *Soyl*, and at two years growth may be transplanted into *Beds*.

Which must be well prepared with dung, first digged about two foot deep, and four foot wide, made level at the bottom, and so mix very good rotten dung with some of the mould and fill them up; considering that it will sink; Then plant your *Asparagus* Plants at about two foot distance, you may plant three or four Rows in this bed of four foot wide, they will in time extend themselves throughout all the Bed.

Some curious persons put *Rams-horns* at the bottom of the Trench, and hold for certain, that they have a kinde of *Sympathy* with *Asparagus*, which makes them prosper the better, but its referred to the experienced.

Ordering and
cutting of them.

Three years you must forbear to cut, that the Plant may be strong, not stubbed; for otherwise they will prove but small; But if you spare them four or five years, you will have them as big as *Leeks*.

The small ones you may leave that the *Roots* may grow bigger, permitting those that spring up about the end of the Season, in every Bed to run to Seed, and this will exceedingly repair the hurt, which you may have done to your Plants in reaping their Fruit.

Of Garden Tillage.

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At the beginning of the Winter, after you have cut away the *Stalks*, cover the Bed four or five fingers thick with new Horse-dung; some prescribe with Earth four fingers thick, and over that two fingers of old dung, which will preserve them from the Frost.

At the Spring about the middle of *March* uncover the Beds, and take of good fat Mould, and spread over them about two or three fingers thick, and lay your dung in the *Alleys* or elsewhere, which will rot, and be fit to renew the Mould the next Spring.

If you take up the old Roots of *Asparagus* about the beginning of *January*, and plant them on a hot Bed, and well defend them from *Frosts*, you may have *Asparagus* at *Candlemas*, which is yearly experimented by some. *Early Asparagus.*

When you cut *Asparagus*, remove a little of the Earth from about them, lest you wound the others which are ready to peep, cut them as low as you can conveniently, but take heed of hurting those that lie hid.

There are divers sorts of this most pleasant and delicious Fruit, and not any of them but are worthy of our care, and that little pains they require in nursing them up. *Strawberries.*

The greater sort delight in a new broken Bed, or at least in such places where they have not grown before, they must be kept stringed, and removed every two or three years, and then will yield a very great encrease, they delight most in warm sandy Soyl, the best Plants are said to be such as come of the Strings.

The white Strawberry, and the ordinary red, may be either planted in Beds, or on the sides of the Banks, at your pleasure.

The ordinary red grows plentifully in the new fallen *Copses*, from whence if you take your Plants about *August*, you will have a very fair encrease.

There is a sort of green Strawberry (though not usual) that lies on the ground under the tall, and slender leaves, exceeding sweet in taste, and of a very green colour.

Also there is another sort of Strawberry of a very excellent scarlet Colour, and most pleasant taste that grows plentifully in *New-England*, and will prosper very well with us, as is experienced by a Merchant at *Clapham*, neer *London*, who hath many of them growing in his Garden.

To preserve them over the Winter (though they seldom die) you strow a little Straw, Litter, Fern, or such like over them.

To have Strawberries in *Autumn*, you may onely cut away the first blossomes, which they put forth, and hinder their bearing in the Spring, and they will afterwards blow a new, and bear in their latter Season; I have gathered many on *Michaelmas-day*. *Late Strawberries.*

As soon as your Strawberries have done bearing, cut them down to the ground, and as often as they spire, crop them, till towards the Spring, when you would have them proceed towards bearing, now and then as you cut them, strew the fine powder of dried *Cow-dung*. (or *Pigeons-dung*, or *Sheeps-dung*, &c.) upon them, and water them when there is cause. *Large Strawberries.*

The

The *Cole-flower* is an excellent Plant and deserves a place in the *Kitchen-garden*, their seeds are brought out of *Italy*, and the *Italians* receive it from *Candia*, and other of the *Levantine* parts, which is the best, and produces the largest Heads.

You may either sow the Seeds in *August*, and carefully preserve them over the *Winter*, or you may raise them in your hot Beds at the Spring, and remove them when they have indifferent large Leaves into good Land prepared for that purpose; but the best way is to dig small pits, and fill them with good, rich, light mould, and therein plant your *Cole-flower* which must be carefully watered.

Cabbages and
Coleworts.

There are divers sorts of *Cabbages*, and of several colours and formes, but we shall here take notice of no more than the ordinary *Cabbage* and *Colewort*, being sufficient for our *Country Kitchen*.

The Seed is to be sown between *Midsummer* and *Michaelmas*, that it may gain strength to defend it self against the violence of the *Winter*, which nevertheless it can hardly do in some years, or you may raise them on a hot Bed in the *Spring*.

In *April*, or about that time, they are to be transplanted into a very rich and well stirred mould, if you expect the largest *Cabbages*, they delight most in a warm and light Soyl, and require daily watering till they have taken Root.

In any ordinary Ground being well digged and wrought, may you raise great quantities of ordinary *Cabbages* and *Coleworts*.

If you intend to reserve the Seed, let it be of your best *Cabbages* placed low in the ground during the *Winter*; to preserve them from the great frosts and cold Winds, cover them with *Earthen pots*, and warm soyl over the pots, and at *Spring* plant them forth.

Lettuces.

This is common a *Sallet-herb* either raw or boyled, and the way of propagating thereof so easie, that I may the better pass it by.

Onely if you have a desire to have them white, or *blanch* them, (as the French term it) then when they are headed or loaved in a fair day, when the dew is vanished, binde them about with long *Straw*, or *raw Hemp*; Or more speedily you may cover every Plant with a small *Earthen-pot*, and lay some *hot Soyl* upon them, and thus they will quickly become white.

Of Beets.

This ordinary Plant is by several made use of; it loves a fat and rich Soyl, its usually sown in the *Spring*, and will come up several years in the same ground, and may be planted forth as *Cabbages* are.

Of Anise.

Aniseeds may also be propagated in *England*, as some have already experienced, by sowing them in *February* between the Fall and Change of the Moon, then strow new Horse-dung upon them to defend them from the Frosts: These will ripen about *Barbolyne-tide*, then also may you sow again for the next year.

Let your ground be well stirred about *Michaelmas*, for that which you sow in *February*, the black rich mellow ground is the best.

Sect. 4.

Of Carrots, Turneps, and other Roots, usefull in the Kitchen.

This is one of the most universal and necessary Root this Coun- *Of Carrots.*
try affords, onely they will not prosper in every ground, they
principally delighting in a warm, light, or sandy Soyl; or if o-
thers, it must be well stirred and manured, but if the ground
be naturally warm and light, though but indifferently fertile,
yet will they thrive therein; it is usual to sow them in the Intervals
between the Beans, in digged, not in ploughed Land, because
of extending their Roots downwards, after the Beans are gone;
they become a second Crop, the best for the Table, the other
for the feeding or fattening of Swine, Geese, &c. Some of the fair-
est laid up in reasonable dry Sand, will keep throughout the Win-
ter; the fairest of them may you reserve till the Spring, and plant
them for Seed.

As to the general way of propagating them, we have already *Turneps.*
given you a hint, therefore have we little more to say, but that
for your Kitchen use you may sow them at several times, and if
the weather, the Birds, or the Worm destroy them, you may re-
new your labor and cost for a small matter; After they are in
their prime, you must house them from the Frost, by laying them
in your Celler, or such like place, on heaps.

This is an excellent sweet Root, and very pleasing to some peo- *Par/neps.*
ple, it is to be sown in the Spring in a rich, mellow, and well
stirred Soyl; when they are grown to any bigness, tread down
the tops, which will make the Roots grow the larger, the like
may be done to Carrots, Turneps, or any other Roots; towards
the Winter when you raise them, they may be disposed of in
Sand, to be preserved as Carrots, Turneps, &c. The fairest
may be kept for Seed as before of Carrots, and then take the fair-
est and tallest tops of those Seeds in the Summer, and sow them,
and by this meanest may you attain the fairest Roots.

The *Skirret* is sweeter than any of the former Roots, they de- *Of Skirrets.*
light in a very fat and light mould, and are raised of the Slips,
being planted in the Spring time, in Ranges about five or six inch-
es asunder; at the Winter when you raise the Roots, you may
lay the tops in Earth till the Spring for your farther encrease.

They are so commonly known, and their propagation so easie, *Of Radishes.*
that here needs no more to be said of them.

These are very usual in forraign parts, and are planted in seve- *Of Potatoes.*
ral places of this Country to a very good advantage, they are ea-
sily encreased, by cutting the Roots in several pieces, each piece
growing as well as the whole Root, they require a good fat Gar-
den mould, but will grow indifferently well in any, they are
commonly eaten either buttered or in milk, I do not hear that it
hath been as yet essayed whether they may not be propagated in
great quantities, for food for Swine or other Cattel.

These are neer of the Nature of the Potatoes, but not so good *Of Jerusalem
Artichokes.*
nor

nor so wholesome ; but may probably be propagated in great quantities , and prove good food for Swine , they are either planted of the Roots, or of Seeds.

Of Onions.

Onions are Roots very much in request for their several and divers uses they are put unto in the Kitchen ; they delight in a fine, fat , and warm mould , and are to be sown in *March* or soon after, but if you sow them sooner, you must cover them at the first ; where they come up too thick , they may be drawn and planted where they are thinner ; when they are grown to some reasonable bigness, you ought to bend down , or tread the Spindle or Stalk, which will make the head the larger , being sown with Bay-salt they have prospered exceeding well. In *August* they are usually ripe, then are they to be taken up and dried in the Sun , and reserved for use , in places rather dry than moist.

Of Garlic.

This is so universally known and propagated , that I need say little of it ; If set in rich Ground , it encreases to admiration, and may be annually multiplyed without hazard of weather , keeping down the Leaves makes the Root large.

Of Leeks.

They are sown as the *Onions* , and afterwards it is best to transplant them deep , that they may have a great deal of *White-stalk* ; one such *Leek* being worth two others.

The fairest and biggest of *Leeks* and *Onions* are to be reserved and planted for Seed, the Stalks whereof are to be propped up with sticks by reason of their weight, when the Seed is ripe , reserve the Heads on some cloath , and let them be through dry ere you rub them out.

There are several sorts of *Kitchen-herbs* and Plants very necessary and useful ; and also profitable to be propagated and advanced in our *Country-gardens* , as *Thyme*, *Hyssop*, *Sage*, *Rosemary*, *Marjoram*, *Violets*, and several others, their ways and manner of planting being so universally known , and not altogether pertinent to our discourse, I shall pass them by, and refer you to others that treat of them.

Se&t. 5.

Of the Manner of Ordering, and Preparing of Garden-Ground, making of hot Beds, and watring of the Gardens, &c.

There are many *Garden-plats* in *England*, and that either for their cold scituation, or the cold or unnatural temper of the Soyl , or such like impediments , and by reason of the ignorance of the *Gardiner* or Owner thereof, it produces little or no Fruit or Tillage answerable to the costs, trouble, or expectation of the Owners thereof: Wherefore we shall give you here the best *Rules*, *Directions*, and *Instructions* we either know , or have read of in any of our Rustick Authors.

The several ways of tempering mould.

If the Land be of a light and warm nature of its self , whereof your Garden is made, there needs onely common *Horse-dung* or *Cow-dung* to be mixed therewith in the digging or trenching, to enrich it ; But if the *Ground* or *Mould* incline to a cold clay, or stiff

stiff Ground, then procure some good, light, and fertile *sand*, or *Mould* of that nature, and mix with your *Dung* in some corner of your *Ground* equally together, and suffer so to lye and rot over the *Winter*, which in the *Spring* will prove an excellent warm Manure to lay to the Roots of your Plants, or to make whole Beds thereof, by mixing it in good quantities with the natural *Soyl*, and if you can procure it with conveniency, the more of *Pigeons-dung*, *Poultry-dung*, or *Sheeps-dung* you mix with it, the lighter and warmer it will be: Also an equal composition or mixture of *Dung* and *Earth* is necessary to be laid by, that it may be thoroughly rotten and turned to *Earth* by the *Spring*, that it may then be fit to renew the earth about your *Hops*, *Artichokes*, and such like, and also for the planting and sowing therein *Coleflowers*, *Cabbages*, *Onions*, &c.

The best and surest way of sowing *Seeds* to have the most advantage of such *Dung* or *Soyl*, and that they may come up most even, and be all buried at one certain depth, is thus: First, rake your Bed even, then throw on a part of your mixture of *Earth* and *Dung*, which also rake very even and level, on which sow your *Seeds*, whether *Onions*, *Leeks*, *Lettice*, or such like, then with a wide *Sieve* sift on the *Earth* mixed with *Dung*, that it may cover the *Seeds* about a quarter of an inch deep, or little more, and you shall not fail of a fruitful Crop.

The best way of sowing Garden seeds.

If your Garden be obvious to the cold windes, which are very injurious to most sorts of Plants, next unto Trees, Pales, Walls, Hedges, &c. lay your ground after this following manner, that is, Let it be laid up in Ridges a foot or two in height, somewhat upright on the back or North side thereof, and more shelving or sloping to the South-ward, for about three or four foot broad, on which side you may sow any of your Garden Tillage, and these banks lying one behinde the other, will much break the Windes, and these shelving sides will much expedite the ripening of *Pease* or other Fruits, by receiving more directly the Beams of the Sun, and in case the ground be over moist, you may plant the higher; and if over dry, then the lower, so that it seems to remedy all extreams, except heat, which rarely injures.

To lay ground warm and dry.

To make a hot Bed in *February*, or earlier if you please, for the raising of *Melons*, *Cucumbers*, *Radishes*, *Coleflowers*, or any other tender Plants or Flowers, you must provide a warm place defended from all Windes, by being inclosed with a Pale, or Hedge made of *Reed* or *Straw*, about six or seven foot high, of such distance or capacity your occasions require, within which you must raise a Bed of about two or three foot high, and three foot over, of new Horse-dung of about six, eight, or ten dayes old, treading it very hard down on the top, being made level, and if you will, edged round with boards, lay of fine, rich mould about three or four inches thick, and when the extream heat of the Bed is over, which you may perceive by thrusting in your finger, than plant your *Seeds* as you think fit, then erect some Forks four or five inches above the Bed to support a Frame made of Sticks, and covered with *Straw* to defend the Seed and Plants from cold and wet, only you may open

The making of hot Beds.

Of watering
of Plants.

your Covering in a warm day for an hour before noon, and an hour after; Remember to earth them up as they shoot in height, when they are able to bear the cold you may transplant them:

Many curious and necessary Plants would suffer, were they not carefully watered at their first removal, or in extream dry seasons, therefore this is not to be neglected; Early in the Spring whilest the weather is cold, be cautious of watering the Leaves the of young and tender Plant, onely wet the Earth about it.

When your Plants or Seeds are more hardy, and the nights yet cold, water in the Fore-noons; but when the nights are warm, or the days very hot, then the evening is the best time.

If you draw your Water out of Wells, or Deep-pits, it ought to stand a day in the Sun, in some Tub, or such like, for your tender Plants in the Spring.

But Pond, or River, or Rain-water needs it not, and is to be preferred before Well-water, or Spring-water.

If you infuse Pigeons-dung, Sheeps-dung, Hen-dung, Ashes, Lime, or any fat Soyl, or Matter in your Water, either in Pits, Cisterns, or other Vessels for that purpose, and therewith cautiously water your Plants, it will much add to their encrease and multiplication.

For Cole-flowers, Artichoaks, and such like, let the ground sink a little round the Plant, in form of a shallow Dish, the water will the better and more evenly go to the Roots.

Water not any Plant over-much, lest the Water carry with it away the Vegetative or fertile Salt, and so impoverish the ground, and also chill the Plant.

It is also better to water a Plant seldom and throughly, than often and slenderly, for a shallow watering is but a delusion to the Plant, and provokes it to root shallower than otherwise it would, and so makes it more obvious to the extremity of the weather.

If you are willing to have the Ground always moist about any Plant, place near it a Vessel of Water, putting therein a piece of woollen Cloth, or Lint, and let the one end thereof hang out of the Vessel to the ground, the other end in the Water, in manner of a Crane: Let the Lint or Cloth be first wet, and by this means will the water continually drop till all be dropped out of the Vessel, which may then be renewed; the end that hangs without the Vessel must be always lower than the Water within the Vessel, else it will not succeed; If it drop not fast enough, encrease your Lint or Cloth; if too fast, diminish it.

If the Weather be never so dry, when you sow any sort of Seeds, water them not till they have been in the ground several days, and the ground a little settled about them.

CHAP. IX.

Of several sorts of Beasts, Fowls, and Insects, usually kept for the Advantage and Use of the Husbandman.

Our Country Farm is of little use and benefit to us, notwithstanding all our *care, pains, and cost*, in Fencing, Planting, or otherwise ordering the same, unless it be well stocked and provided with Beasts and other Animals, as well for labour and strength in Tilling and Manuring the Ground, and facilitating other labours and exercises, as for the furnishing the *Market* and the *Kitchen*.

Sect. I.

Of Beasts.

The Horse hath the preheminance above all others, being the noblest, strongest, swiftest, and most necessary of all the Beasts used in this Country, for the Saddle, for the Plough and Cart, and for the Pack. *of the Horse.*

Where you have good store of Pasture, either in Several, or in Common, or in Woods, or Groves, it is no small advantage to keep a Team of Mares for the Breed; but where there is most of Arable, and little of Pasture Land, Horses or Geldings are more necessary; which difference we may observe between the great breeding places for Horses in the Pastures and Woodlands, and the naked Corn Countrys, the one full of gallant lusty Mares, the other of Horses and Geldings.

As to the shape and proportion, colours, age, ordering, breeding, feeding, and curing the several Diseases of Horses, I shall here be silent, and refer you to the several Authors who have copiously treated of that subject, it being too large for this place.

Asses are commonly kept, yet not to be little set by, because of their sundry Commodities, and the hardness of their feeding, for this poor Beast contents himself with whatsoever you give him, Thistles, Bryars, Stalks, Chaff, (whereof every Country hath store) is good meat with him: besides he may best abide the ill looking to of a negligent Keeper, and able to sustain blowes, labour, hunger, and thirst, being seldom or never sick: and therefore of all other Cattel longeth endureth: for being a Beast nothing chargeable *of the Ass.*

ble, he serveth for a number of necessary uses, in carrying of burdens he is comparable to the Horse, he draweth the Cart (so the load be not unreasonable) for grinding in the Mill he passeth all others. *Thus far Heresbatch.*

The *Milk* also of the *Ass* is esteemed an excellent restorative (by most learned *Physicians*) in a Consumption.

But I presume one main impediment of their not being so frequently kept, is their destructive nature to Trees, which they will bark with their mouths where they can come at them, no ways pleasing to a good Husband.

Of the Mule.

The *Mule*, or *Moil*, is bred of a Mare covered with an *Ass*, its a hardy Beast much better than an *Ass*, and very tractable and capable of much service.

Of Cows and Oxen.

These worthy sort of *Beasts* are in great request with the *Husbandman*, the *Ox* being useful at his *Cart* and *Plough*, the *Cow* yielding great store of Provision both for the *Family* and the *Market*, and both a very great advantage to the support of the Trade of the Kingdome.

Concerning their Form, Nature, and Choice, I need say little, every *Country-man* almost understanding how to deal for them.

As for their breeding, rearing, breaking, curing of their Diseases, and other ordering of them, and of *Milk*, *Butter*, and *Cheese*, &c. I refer you to such *Authors* that do more largely handle that subject, than this place will admit of.

Of Sheep.

Next unto these, the *Sheep* deserves the chiefest place, and is by some preferred before any other, for the great Profit and Advantage they bring to *Mankind*, both for *Food* and *Apparel*.

Whereof there are divers sorts, some bearing much finer *Wool* than others, as the *Heresford-shire Sheep* about *Leicester* bear the fairest *Fleeces* of any in *England*; Also they are of several kinds as to their proportion, some are very small, others larger; But the *Dutch-sheep* are the largest of all, being much bigger than any I have seen in *England*, and yearly bear two or three *Lambs* at a time; It is also reported, that they sometimes bear *Lambs* twice in the year. It may doubtless be of very good Advantage to obtain of those kinds, and also of *Spanish-sheep* that bear such fine *Fleeces*.

As for their breeding, curing, and ordering, I refer you (as before) to such *Authors* that have largely treated of them.

Of Swine.

This Beast is also of a very considerable Advantage to the *Husbandman*, the *Flesh* being a principal Support to his *Family*, yielding more dainty Dishes and variety of meat than any other Beast whatsoever, considering them, as *Pig*, *Pork*, *Bacon*, *Brawn*, with the different sorts of *Offal* belonging to them; Also they are of the courtest feed of any Creature whatsoever, being content with any thing that's edible, so they have their fill, for they are impatient of hunger.

It is a great neglect that they are no more bred and kept than there are, their food being obtained at so easie a rate; Besides the *Offal* of *Corn*, *Whey*, and other *Culinary* Provision, it cannot but prove a very considerable Advantage to sow or plant Land on purpose

pose with *Coleworts*, *Kidney-beans*, and several other grosse thriving Pulses, Plants and Roots, whereby you may not onely raise a considerable stock of them, to your great gain and profit, if *old Tisser* said true;

And yet by the year have I proved ere now,
As good to the purse, is a Sow as a Cow.

But also by their treading and battling, in case they be kept in a Court made several for that purpose, they will convert all such Vegetables they eat not, into excellent Soyl.

If they are suffered to run abroad, they waste their flesh much; therefore it is esteemed the most frugal and beneficial way, to keep them always penned into some Court, both for their flesh, and Soyl.

These are kept in some places for Advantage, being a very *of Goats* course feeder, the *Kids* are esteemed good Meat, their hair also is of use, to make Ropes and other things, it never rots in the Water; The best sort of them breeds twice in the year, they are usually kept in *Stables* where many *Horses* are, to preserve them from several Epidemical Diseases.

The Milk of *Goats* is esteemed the greatest Nourisher of all liquid things, whereon we feed (except womans Milk) and the most comfortable to the *Stomack*, from whence the Poets fain that their God *Jupiter* himself was nourished with *Goats Milk*.

They crop and are injurious to young Trees, therefore are to be kept with much caution.

Although they are not esteemed amongst the number of profitable *of Dogs* Cattel, yet are they very necessary servants, and the most observant and affectionate of all Beasts whatever to Mankind; Their love even to the loss of their lives in defence of their *Master*, his *Cattel*, *Goods*, &c. their officiousness in hunting, and seeking after all sorts of *Prey* or *Game*, are so commonly known, and so frequently made use of, that its needless to tell you so.

Onely that they are of different sorts and natures, some as a *Guard* to defend your *House* and *Goods*, others as *Shepherds* to defend your *Sheep* and *Cattel*, others as *Jaccals* or *Watchmen*, always wakeful to rouse up the heavy *Mastiffes*, whereof some are for the *Bear*, others for the *Bull*.

Some *Dogs* also are for the *Game*, as for the *Stag*, *Buck*, *Fox*, *Hare*, *Coney*, *Pollecat*, *Oster*, *Weefel*, *Mole*, &c. Also for the *Duck*, *Pheasant*, *Partridge*, *Quayl*, *Moore-bens*, and several other sorts of Land and *Water-fowl*.

Others also are kept for their *Beauty*, *Shape*, and *Proportion*, and for their docible nature, being apt to *dance* and perform several other Acts of Activity, &c.

Sect. 2.

Of Fowl.

Of Poultry.

The *Country mans Farm* or *Habitation*, cannot be said to be compleatly stored or stocked without *Fowl*, as well as *Beasts*, yielding a considerable Advantage by their *Eggs*, *Broods*, *Bodies*, and *Feathers* amongst which the *Poultry* seems to have the Preheminence, being more universally kept than any other sort whatsoever, insomuch that any poor *Cottager* that lives by the high-way side may keep of them, being able to shift for themselves the most part of the year, feeding on *Insects*, and on any thing almost that's edible by any other sort of Animal.

Profit of Poultry.

They are also kept to a very great Advantage in the back-sides, and at the Barns-doors of great Farms, and as I have been certainly informed a good Farm hath been wholly stocked with *Poultry*, spending the whole Crop upon them, and keeping several to attend them, and that it hath redounded to a very considerable Improvement; It seems also consonant to reason, especially if within a days Journey of *London*, that they might have a quick return, and a good Market, being in a Capacity to furnish the Market throughout the year either with *Eggs*, *Chickens*, *Pullets*, *Capons*, or *Cocks* and *Hens*; Also the *Feathers* must needs yield a considerable Advantage, and the dung of *Poultry* being of great use on the Land, much exceeding the dung of any Cattel whatsoever.

Feeding and fattening of Poultry.

Therefore if convenient places or houses were made for them, as dark as may be, which doth much expedite their fattening, and the *Poultry* there fed, and their dung reserved, and before it hath taken wet, let it be mixed with Earth, it will undoubtedly answer the expence of a great part of the Corn you feed them withal.

Encreasing of Eggs.

Hatching of Eggs artificially.

If they are fed with *Buck*, or *French-wheat*, or with *Hemp-seed*, they will lay more Eggs than with any other sort of Grain.

In *Egypt* they hatch their Eggs in great quantities in *Ovens* made for that purpose, in several places in this Countrey also one Hen will lead the Brood of two or three Hens, so that they be hatched neer about a time; therefore may you with much facility hatch three or four dozen of Eggs in a *Lamp-furnace* made of a few boards, onely by the heat of a *Candle* or *Lamp*, so that you order them that they may hatch about the same time that the Hen hatches her Eggs that you intend shall lead them; By which means in a warm room may one Hen lead many Chickens, and raise them up with little charge, and without the loss of time of the other Hens.

This way may be of singular use, where you keep *Poultry* of divers kinds, that is, of the largest kinds to lay, and a few of the lesser to sit, and nurse up the *Chickens*.

Of Geese.

They are a Fowl, very profitable in many places where there are *Commons* to feed them on, being a Creature that requires little care and attendance, and little charge in feeding them.

They multiply extraordinary in some places, breeding twice a year, and in all places yielding a considerable price.

Also

Also their Feathers are no small Advantage, especially if you shear them as they do Sheep, as in some places is usual.

You may set them on any number of Eggs under fifteen, and above seven, giving to each Goose her own Eggs; for (its said) they will not hatch a strangers.

The young or *Green Geese* are best fatted, if kept dark and fed with ground Malt, and Milk mixed together. Of fattening of Geese.

The old and stubble *Geese* will be fat the same way, or fed with new Malt.

But in fattening of *Geese* you may observe that they usually sit, especially in the night time with their *Beaks* or *Bills* on their *Rumps*, where they suck out most of their moisture and fatness at a small bunch of Feathers, which you shall finde standing upright on their *Rumps* always moist; which if cut away close before you put them up to fattening, they will be fat in much less time, and with much less meat, than otherwise. A principal Observation in fattening of Geese.

They will feed on, and fatten also with Carrots cut small, and given them.

The *Jews* who are esteem'd the skilfullest feeders that be, do wrap the *Goose* in a linnen Apron, they hang her up in a dark place, stopping her ears with Peason, or some other thing, that by neither hearing nor seeing of any thing, she be not forced to struggle nor cry; after they give her pellets of *Ground-malt*, or *Barly* steeped in water thrice a day, setting by them water and gravel, by which manner of feeding they make them so fat, that it is almost incredible. The Jews manner of fattening Geese.

I have heard it also confidently affirmed and related, that in *France* that the *Relator* saw *Carps* fatted by being bound with their Noses upright, and daily fed with whitebread and wine, whether their bodies were in the water or no I remember not; This as he affirmed made the *Carps* exceeding fat and pleasant.

Most certain it is, that darkness doth much conduce to the fattening of any creature, and also rest and sleep, as appears by the *Bears* and *Foxes* in the *Northern Climates*.

Gravel also not a little availeth, it being usual that when *Poultry* are penned up and have lost their appetite, being set where Gravel is, will greedily eat it.

Tame *Ducks* being much of the nature of *Geese*, that we shall say the less of them, onely that they require more water to dabble in than do the *Geese*, and that they are not so good meat; There are some sorts of them that lay great store of Eggs, which are more to be preferred, and are distinguished from the other by the turning up of their *Bills*, more than the other sorts. Of Ducks.

There are also a certain sort of *Ducks* kept onely to draw unto them, and as it were trappan whole Flights of *Wilde-Ducks*, and bring, or conduct them to the places of their retirement, which are Pooles made on purpose; The manner and form whereof, and also of the breeding of these sorts of *Ducks*, and the taking of the wild Fowl they bring with them, we leave to the more skilful in that exercise to treat of. Of Decoy Ducks.

Turkeys, or *Ginney-hens* or *Cocks*, are a *Melancholy Fowl*, as appears

pears by their doleful cry, and the Anger that they seem to have against red colours, being posselt with a strong conceit that they are mocked, by reason their own *Comes* or *Wattels* are red; They are a great feeder, devouring more than they are worth by far, if they are fed with Corn, but if let at liberty and have ranging room enough, they feed on Herbs or the Seeds of Herbs, without any great charge or trouble, except in the breeding, at which time they require careful attendance, being an extreame chill Bird.

They are seldome very fat till the Winter be well spent, that they forget their lust, the cold weather gets them a stomach, and the long nights afford them much rest.

Of Pigeons.

Several sorts of *Pigeons*, or *Doves* there are, both wilde and tame, As *Wood-pigeons*, or *Wood-Quests*, *Rock pigeons*, *Stock-doves*, *Turtle-doves*; then there are *Houfe-pigeons*, such as are usually kept in *Dove-cots*, or *Pigeon-houses*; and divers sorts of *Tame-pigeons* fed by hand, kept for their largeness of body, for their beauty, and diversity of colours, breeding almost every moneth in the year: But we shall onely here treat of *Pigeons* kept in *Dove-houses* that bring in, unto such that are priviledged to keep them, a considerable yearly Advantage, with very little cost or trouble, onely feeding of them in the snowy or frosty weather, when nothing is to be had abroad, and about *Midsummer* before *Pease* are ripe, which time they usually call *Benting-time*, because then necessity enforceth them to feed on the *Bents*, or seed of *Bennet-grass*, no other food being then to be had; and usually about that time have they store of Eggs and young ones, which will otherwise be starved unless you help them; but the Dung of their Houses will in a manner satisfie you for their Meat, if carefully made use of.

To encrease a Stock of Pigeons.

There is nothing that *Pigeons* more affect than *Salt*, for they will pick the Mortar out of the Joynts of Stone or Brick-walls, meerly for the saltnefs thereof, therefore do they usually give them as oft as occasion requires, a Lump of Salt, which they usually call a *Salt-Cat*, made for that purpose at the *Salterns*, which makes the *Pigeons* much affect the Place, and such that causally come there, usually remain where they finde such good entertainment.

Assa fetida.

If *Assa-fetida* be boyled in Water, and the holes washed therewith, their Feathers will bear the scent thereof about them, that whatsoever company they light into, will be so well pleased therewith, that they will bear them company home, to the great encrease of your Stock.

Cummin-seed.

This hath been always esteemed an excellent Drawer of *Pigeons*, either by washing the holes with water wherein it hath been boyled, or feeding them with meat steeped in such water.

A baked Bitch

But that which hath been experienced to have had the greatest power to draw these Birds from their former homes to the place you desire, is that you take a *Bitch* (in her heat of lust, or hot, or salt, as they usually term it) and after she is flayed and bowelled, bake her in an *Oven*, (some prescribe to roast her with Cummin-seed in her belly) then lay her in the *Pigeon-house*, and if you have but few *Pigeons* there, you shall soon finde a wonderful encrease.

This

This hath been an experienced, way to stock a decayed House in a very short time.

These *Birds* are kept for their *Beauty* and *magnificent Deportment*, Of Swans. being the *proudest*, *chastest*, and *least sustainer* of *Injuries* of any other; Their *Flesh* not so much regarded as the *Flesh* of other *Water-Fowl*.

Yet is the *Cignet* a *Noble Dish* at great *Entertainments*, which may be *fatted* and made the more acceptable, by keeping them apart in a close *Pond*, out of which they cannot get, having onely a little dry *Grass-plat* to sit and prune themselves in, near to the *Water* you shall place *Tubs* or *shallow Vessels*, with *Oats*, *Wheat*, *Barley*, *Dryed Mault*, or such like, some dry, and some in *water*, for them to feed on at pleasure, and sometimes cast them some hot *sweet Grains* on the *Water*; by this means in one moneth may they be fat. Fatting of Cignets.

These *Birds* are usually kept for their excellent *Beauty* and *De-* Of Peacocks. *portment*, yet they are beneficial also to the places where they are kept, by cleansing them of *Snakes*, *Adders*, and such like, their *Chickens* also are good meat.

It is a *Bird* also of *Understanding* and *Glory*, for being praised, he elevates and spreads his lofty *Tail*; and of *Pride*, for no sooner doth he behold his feet, not thinking them compleat enough for so painted a *Pageant*, he lets his *Tail* fall for meer conceit; which also appears by his *Melancholly Posture* at the loss of shedding of his *Tail*, till *Nature* hath renewed it.

In any place these may be kept for pleasure and variety; but in places near *London*, or some great *City*, for advantage. Of some Pheasants, and the ordering of them.

Mr. *Hartlib* hath the Relation of a *Lady* that kept so many near *Chelsey*, that she hatched two hundred in one *Spring*, whereof, that though many died, yet by far the greater part would come to perfection; Also that there are many near *London*, who keep them to make profit of them, that they are very easie to bring up, and to to keep, when they are once past the first moneth, for till then they must be kept only with *Ants Eggs*, and fed with nothing else, which are easily obtained; the first moneth being past, they are fed with *Oats* onely, requiring nothing else: But as they love to be kept in *Grassie fields*, so one must change them oft to fresh *Grounds*, because they taint the *Grass*; Also the *Courts* may be inclosed with *Lathes*, the *Fence* must be made high, and places of refuge covered with *Nets* to keep the *Hawk* from them and their *Chickens*, which they more greedily desire than any other *Game* whatsoever.

SECT. 3.

Of Insects.

Over and above the *Stock* of *Cattel*, *Fowl*, &c. wherewith the *Countrey-Farm* is generally replenished, there are several sorts of *Insects* that being judiciously and carefully mannaged and ordered, may bring into the *Husbandmans Purse* no small advantage; Amongst many of them that are useful in several *Countreys*, and to several ends and purposes, we have onely two, which are *Bees* and

Silk-worms, that are familiarly known and preserved amongst us, whereof we shall treat apart. And first of *Bees*.
 Of Bees. Being so commonly known and kept in this Kingdom, that there is scarcely a Village (excepting near great *Cities* and *Towns*) where they are not kept; whereof there are so many several *Treatises* written and published full of Rules, Precepts, and Directions for the ordering, preserving, and managing these profitable *Creatures*, both after the old and commonly known Method, and according to such new Ways and Inventions that have been lately discovered and experienced, for the Improvement and Advancement of the Income or Profit of this most admirable Creature; Which several ways of ordering them being so multifarious, and the several *Treatises* written on them so difficult to obtain, so intricate to be understood; and their Rules and Directions so different, and uncertain, and subject to so many gross Errors and Mistakes, I hope it will be an Acceptable Work to the Countrey man, for me in this place to give you the most select and approved Rules and Directions that are dispersed in such several Authors, and to discover unto you the many fallacies and deceits that some would lead you unto, by pretending newer and more advantageous ways of ordering them than before were known, who themselves had never made a through Experiment of what they published, ever referring unto the *Ingenious* and *Worthy* B. UTLEK the Praise and Respects justly due unto him, for his most accurate and excellent Piece on this Noble Subject; who hath as methodically and completely handled this Part, as ever any Author in our Language did any other, belonging to the whole *Mystery* of *Agriculture*, or in any wise relating to it; yet are there many Rules, Precepts, and Ways of Ordering these *curious* Creatures, not mentioned in his Book, else had it been needless here to have said any thing concerning them.

The praise and
 pleasure of
 Bees.
 Virgil.

There is no Creature to be kept about our Rural Seat, that affords unto us so much *Variety* of Pleasure, as the Bee.

In tenui labor, at tenuis non gloria:

Although they are small, yet they are numerous, and although they are busied up and down on poor and mean things, yet the Matter they collect is Rich and Noble; They never rest, nor are idle, but in the extreamest cold and wet seasons. In the Spring the first warm Sun invites them abroad, to seek after Employment, which they daily follow, till the bitter Frosts, cold and stiff Winds,

Virgil.

————— *Nam pabula venti*

Ferre domum prohibent —————

and great Rains hinder them. They are out early in the morning, you shall hear them like Swarms humming on the Line-trees by the Sun-rising, when they send forth the fragrant scents from their Blossoms; Also in the Evening late shall you have them return from their hard, yet pleasant labors.

Virgil.

At fesse multa referunt se nocte minores,

Crura thymo plena; —

Idleness is so detestable a Vice amongst them, that they will not admit

admit of it, nor tolerate it in any (save their Sovereign) but every one is continually busied either abroad in collecting their Food, or at home in building Combs, feeding their young, or some other employment.

Namque alie victu invigilant, & federe pacto, Virgil.
Exercentur agris; pars intra Septa domorum.

There are no Creatures persist in that *Unity* and *Amity* one towards another in the same house or habitation, they having no single propriety in any thing they do or get; for whatever they gather all have a part, if any be injured the other will revenge his wrongs, although to the loss of their lives.

Their labour is not compulsive, every one acting his part voluntarily, and seemingly contend, and endeavour to outvie each other in their nimble and expeditious voyages, where they so mightily lade themselves, that many times their decayed Wings are not able to support them home.

Sape etiam duris errando in cotibus alas
Attrivere, ultroque animam sub fasce dedere
Tantus amor florum, & generandi gloria mellis.

What living Creature can you keep about you, that can yield you more pleasure, delight, and profit, than these that possess so little room, as a small partition of your Garden; that require no other houses than what's made of Straw, unless you will afford them a better that seek their own food throughout the year, if judiciously ordered, that require so little trouble and attendance, as onely a careful inspection some few hours in the day, into your *Apiary*, in the months of *May* and *June*, and the lending unto them your assistance sometimes in their defence against their enemies, and to help them in their necessities, in the *Winter* time and bad weather, when they cannot help themselves, and that yield so considerable an yearly reward unto you, for all your care, pains, and industry about them.

There can be nothing kept more advantageous than an *Apiary*, according to the stock or sum you lay out; many a Countrey man hath raised a sufficient livelyhood onely from these laborious Creatures, we need produce no President for it; It is so usual, *Virgil* also seems to hint as much where he saith:

Corycium vidisse senem, cui pauca relicti
Jugera ruris erant. Nec fertilis illa juvenis,
Nec pecori opportuna seges, nec comoda Baccho,
Regum aequabat opes animis; seraque revertens
Nocte domum, dapibus mensas, onerabat inemptis.
— *Apibus fetis idem, atque examine multo,*
Primus abundare.

But many are ready to object, that they will not thrive in this or that place, or with this or that person, and that sometimes they thrive a year or two and no more, with many other such like conceits, which if rightly considered, it is onely the ignorance, sloathfulness, or willful neglect of the Keeper, or Master of them that occasions these mishaps, and I question not but if the due and orderly

orderly Rules hereafter mentioned be observed: but that they will equally thrive at all seasonable times, and with all persons, the places and other accidents considered.

Of the Apiary

Principio sedes Apibus, statioque petenda. Virgil.

A convenient and necessary place is to be made choice of for your *Apiary*; It is usual for those that have but few, to place them in any corner of their Garden, or in their Courts or Backsides, and some in the Closets adjoining to their houses, others for want of convenient room without doors, have set them in the lofts or upper rooms of their Houses, and in all or any of these places, will this laborious Creature live, but not with that content, nor to that Advantage of the *Bee-master* as if more propitiously disposed of, for either they have not sufficient of the Sun wherein they principally delight, and which enables them for their employment, or they are too much open to the Winds; which is a great hinderance to them in their return when laden, or they are subject to Annoyances incident to such close corners, and inconvenient places, which is a principal cause of their not thriving so well as otherwise they might do, if better placed.

Form and manner of the Apiary.

Therefore where it is in your Election what place to have, and intend to possess your self of a considerable Stock of *Bees*, make a square Plat, and sever and divide it by its self, of capacity answerable to the stock you intend to raise, but rather bigger than less, and rather long (extending from *East* to *West*) than square facing to the *South*, rather inclining to the *West* than *East*, because of the *Bees* late returning home, that they may not then want light: but some are of another opinion, that its best to let them have the first Sun in the morning, that they may go early abroad, that being the most apt time for the gathering of honey; also I have known *Bees* thrive very well having the first rise of the *Sun* at their doors, and others not to thrive being detained some hours from it, by shaddowy Trees, and in another place by a Wall, but the surest way is to let them have as much of both morning and evening Sun, as the Places and Fences will give way to.

Let it be securely defended from high winds on every side, either natural by Hills, Trees, &c. or Artificially by Houses, Barns, Walls, Pales, Hedges, &c. and let the highest Fences be on the North, the other should be but low, or far distant, lest it hinder the *Sun*, and also their flight; also let there be no ill smells or favours neer it, nor that Poultry frequent the place.

Let the ground of your *Apiary* be kept mowen, not digged, nor pared, because it is too hot in the Summer, and too cold in the Winter.

It is also very convenient to plant several Trees at some reasonable distance from your *Bees*, as *Plum-trees*, *Cherry-trees*, *Apple-trees*, *Filberts*, *Hazels*, *Thorns*, &c. that they may pitch at swarming time, neer at home, and not be in danger of being lost for want of a lighting place; For want whereof you may stick up green boughs, and the *Bees* will pitch upon them.

Also let not your *Apiary* be very far from your home, that you may

may be often with them at swarming time, and on several other occasions.

The common and usual way is either *Stools* or *Benches*, *Stools* Of the seats or stools for Bees. are used by most, and esteemed the better, of the two, some whereof are of *Wood*, and some of *Stone*, the *Wood* are esteemed the better, the *Stone* being so hot in the *Summer*, and cold in the *Winter*; These *Stools* also are placed at different heights, some on the ground, others mounted aloft two foot high, but *in medio veritas*, about twelve inches is an indifferent height, and set a little shelving, that the Rain may run off: These *Stools* also ought to be two or three inches wider than the *Hives* you place upon them, with a place before a little broader for the *Bees* to light on.

These *Stools* ought to stand at least five foot the one from the other, measuring from the middle of each other *Stool*, in streight *Ranks* from *East* to *West*; which *Ranks* if you place them one behind another, had need be six or eight foot asunder, and the *Stools* of the one *Rank* placed against the open places or intervals of the other, place them not neer the Fences on neither side, nor before, for hindering their flight.

Benches are also used by many, some I have seen placed the one Of Benches. above the other, and on each a row of *stooks* of *Bees*, which although they may possibly thrive, yet is not in any wise convenient; for *Benches* cannot be thought necessary unless you place the *Hives* neer together, which produces many inconveniencies; Also one cannot so easily come at them, to trim, dress, or order them, where they stand so neer, or on *Benches*, as where they stand singly or apart.

But if you intend to go through stitch with the work, and make a compleat *Apiary* worthy of your care and pains, and wherein you intend to place a part of your delight, you may make for every Stock of *Bees* you intend to keep, a square Cott or House of about two foot square, and two foot and a half in height, set on four legs about two inches above ground, and five or six inches within the ground, and covered over with Boards or Tyles to cast off the Rain, the back or north side being closed up, and the sides respecting the *East* and *West* to have doorsto open and shut at pleasure, with Latches or Hasps to them, the face or south side to have a Falling-door to cover the one half thereof, which is to be elevated at pleasure, and serves in the Summer time for a *Pent-house*, not onely to keep off the beating Rain from the *Hives*, but to defend them from the extream heat of the Sun, which about the mid-day is apt to melt their honey, the other lower half should have two small doors to open to either hand, which will serve to defend the doors or the holes of the *Hives* from injurious *Winds*; when the *Winter* approacheth, and the cold *Winds* are like to injure your *Bees*, then may you fasten all your doors, which will as well defend your *Bees* from the extremity of cold in the *Winter*, as extremity of heat in the *Summer*, both injurious to this innocent, and industrious Creature.

Virgil.

Nam frigore mella
 Cogit hyem, eademque calor liquefacta remittit
 Utraque vis Apibus pariter metuenda;

You may remember at the bottom of your little doors, to make an open square place just against the Tee-hole, that the Bees may have some liberty (after you have shut the doors) to fly abroad.

Here needs no Hackle to defend the Hive from Rain, nor is there any fear of wet or winde to annoy them; here may you place any sort of Hives, whether of Straw, Boards, Glass, or any other thing whatsoever, without any sudden decay or loss by the injuries of Weather, which by placing them abroad they are subject unto; by the means of the side-doors, especially if you make the West-door to open to the right hand, may you sit secure and observe the several workings of the Bees in your Glass-Hives, if you are pleased to make use of them; but if not, you may at these places order, view, and observe them, better than when they stand on naked Stools, and with less offence to the Bees, and more security to your self.

In the Winter time if your Apiary stand cold, and you fear the extremity of Frost may injure your Bees, you may within these doors, stuff good sweet Straw about your Hive, to keep the Bees the warmer.

But extremity of cold injureth not the Bees so much in the Winter, as wet, which these cases best preserves them from, or as light and the warm Beams of the Sun, at such time when there is no provision abroad for them, against which this house or cot is a most certain preservative; For when the doors are shut in such moneths you are not willing they should fly abroad, although the Sun shine, yet they are dark, and unsensible of so small a heat, the Hive standing six or eight inches within the doors, when after the common way of Stools or Benches, the Sun casts his rays to their very doors, which warmth and light together excite them forth to the expence of their provision, and the loss of many of their Hives, as is evident by frequent experience, the mildest and clearest Winters starving and destroying the most Bees; and on the contrary, the coldest and most frozen Winters best preserves them; it is also more plainly manifest, that in the Northern Regions, as Russia, Muscovia, &c. Bees do much more abound in the Woods than in these parts, their Winters being so dark and so cold, which by this way may in some measure be imitated.

In the Spring time also there are several days that are not fit for the Bees to be abroad in; at such times may you keep the doors shut, leaving onely the under-passage open where such that list may take the Air, though by far the greater part lye still unsensible that the Spring is so near. But when you see the Weather is good, and that the Willow or Withy yields them employment, you set open your two under-doors, that the warmth and light of the Sun and Air may encourage them to work, otherwise you will hinder their early breeding, and make them slothful; for I have had the experience, that by setting an empty Hive before a full, expecting

pecting that by the continual passing of the *Bees* to and fro through that empty *Hive*, they might stock it, that so I might have had two Stocks for one without swarming, but it framed not according to expectation, the *Bees* in the inner *Hive* being so far removed from the light and air became lazy, and did not encrease nor labour so well as those that were otherwise ordered, therefore open your doors in time, but not too early for fear of the other extream, we can give you no certain time for it, because the Springs vary, sometimes two or three weeks.

Several sorts of *Hives* are used in several Countreys, but here in *England* they generally make use of two sorts, either *Wicker-Hives* made with Spleets of Wood, and daubed with *Com-cloam* tempered for that purpose, or *Strawn-Hives* made of good Wheaten-straw bound with Bramble, which are the best, and most usual, that are yet common. *Of the Hives.*

The *Wicker-Hives* are still at fault, the Loom mouldering away upon every occasion, which is not in any wise good for the *Bees* who love not to have any vents open, but their doors.

There is great diversity of opinion amongst Authors, concerning the bigness and form of the *Hive*, some preferring the high and narrow *Hive*, of three foot in height, and one in breadth; or of two foot broad, and two foot high, neither of which can be convenient; but that Form which is most round, and in quantity about half a bushel and upwards, is most in use, and is esteemed the best way, and fittest size for your purpose; some you may have under half a bushel for small *Swarms*. *The form and bigness of the Hives.*

Before you put any Swarm into a new *Hive*, you must make the in-side as smooth as may be, from the ends of Sticks and Straws, which much trouble the *Bees*, who spend much of their time in gnawing them off, as in the night time you may observe in a few days after the Hiving. After that you have picked out the greatest Sticks and Strawes, then rub the inside over with a *Sand-stone*, and then singe it with a little flame of Straw, and wipe it clean. *Dressing the Hives.*

Hives may be made of boards, either of an eight square form joyned together, or round with *Hoops* like a Milking-pail, flat on the top. In these *Hives*, if they are made of Wood that hath no unfavoury scent or taste, as *Deal*, *Beech*, or such like, the *Bees* will delight and breed as well as in either of the other, and they will last many yeares, and are freer from the Injuries of the Weather, and several other Casualties the other are subject unto, provided they are made with dry seasoned Wood that is not apt to shrink. *Of Wooden Hives.*

In these *Hives* of Wood may be made several *Glass-windows*, at what height or distance you please, not onely for your observation of their work, which you may with much facility and delight perceive how far they proceed, and in what time, but that the *Bees* also may have the more light, a principal help and encouragement in their labours. *Of Glassen Hives.*

To every of these *Windows* of *Glass* you ought to have a small and light *Shutter* of *Wood* to haps on the outside of the *Glass* in cold weather, and at such times as the *Sun* shines on that part of the *Hive*, it being subject to both extreams of Heat and Cold, yet so as you may take them down at your pleasure for your inspection, and leave such always down during the *Summer*, that are from the *Sun*-wards.

We have also an Experiment of *Glassen-Hives*, published by Mr. *Hartlib* in his *Commonwealth of Bees*, as invented by one Mr. *William Mew* Minister at *Easington* in *Glocester-shire*, and thus written :

“The Invention is a fancy that suits with the Nature of that Creature, they are much taken with their *Grandeur*, and double their Tasks with delight ; I took (saith he) fourteen quarts out of one of the transparent *Hives*, double their quantity of others, they quickly paid me the Charges with their Profit, and doubled it with pleasure. And in another place thus :

“They serve onely to give me an Account of the daily In-come, and a Diary of their Negotiations, whereby if I spend (saith he) half an hour after Dinner or Supper, I know what hath been done that day ; can shew my friends the *Queens Cells*, and sometimes her Person, with her Retinue ; she afforded me fourteen quarts, or near upon, in one year, and if the rest afford ten a piece, I think it a fair gain : There is not a *Hive* to be seen about my House, nor a Childe stung in a year ; My *Apiary* consists of a Row of little houses, two Stories high, two foot apart, which I finde as cheap at seven years end as *Straw Hackles*, and far more handſom. Thus far Mr. Mew.

We also in the same Book finde the description of a *Bee-hive* made of Boards of an *Obogonal* Form, with a *Glass*-window on the back-side of it, for the observation of their work, the rest of the inside of the *Hive* lined with *Mat* made of *Rushes*, three of these were set one on the other, with open passages between each of them, which produced these effects, viz.

In *May* (saith the Relater) we put in two Swarms together, leaving the places to go in, open onely in the lowermost, but all the passage-holes open from box to box ; in the middlemost they first began their Combs, then in the lowermost, before they had filled the middlemost, and so continued till they had filled both ; which before they had quite finished, they began to make two little Combes in the Upper-box, &c.

The Combs in the lower Stories were well replenished with Honey, and suddenly, but these little Combs in the upper, they quite desert. Thus far that Relation.

These are the several Descriptions and Forms of *Bee-hives* we have met withal published, but it is reported that there are several other Forms and Fashions made, and that with very good success, as well for the advantage of the *Bees*, as pleasure of the *Bee-Master*, by several Worthy and Ingenious Persons. It would be very much

much for their Credit and Reputation, and exceeding satisfactory to others, if such their Inventions and Observations were made publick.

As for my own particular, I have made many and difficult Experiments and Essays towards the Advancement of the Profit and Pleasure of this Industrious Animal, and have made use of most of the former sorts of *Bee-hives*, and framed several others, with remedies and provisions for such Inconveniences and Omissions I found in the other; and have with as much caution observed the Operations and Nature of *Bees* throughout the whole year, as my occasions would give way to, and my shallow capacity could apprehend, as you may finde by the sequel of this *Traitt*; yet have I not finished to attain the right *Method*, or way of ordering them, as I principally aim at; the two unseasonable years for *Bees* 1665, and 1667. and my present removal, preventing the greatest part of my Design; It also being the work of a year, or at least that part of time that comes but once a year, to make one Experiment or Observation; And the Observations already published which ought to be a Guide, prove rather an *Ignis Fatuus* to lead one out of the way, than an *Index* to point out the truth, as we shall hereafter in this Book make appear.

But before we have done with the *Hives*, we must not forget ^{Of spleeting} the *Spleeting* of them. The way they usually spleet the ordinary ^{of the Hives:} Strawn and daubed *Hives*, every *Countrey Coridon* understands; As for our *Wooden* or *Glass Hives*, some prescribe that there be three down-right sticks from the top to the bottom, and about two small Hoops fastened unto them at convenient distances, which will very well serve for the fastening and supporting of the Combs, which way I have used, its best to let the perpendicular sticks extend to the bottom, for the *Bees* the better to crawl up by them to the Combs: but you may have onely down-right sticks, or any other wayes placed, as best agrees with the Form of your *Hive*, so that there be not too wide Intervals between.

Having prepared such *Hives* you design to make use of, the ^{Of the swarming} onely way to stock them is by putting Swarms into them, notwithstanding I have many times attempted to entice, and enforce them without swarming (confiding too much on the Writings and Reports of other men) out of their own old habitations, into my new *Hives*. ^{ing of Bees.}

The one way I used was this, I set an empty *Hive* before a full, that the *Bees* passing from their old through the new and empty *Hive*, might choose rather to live therein, than go forth in Swarms to seek another; but the long and darksome passage, being of Strawn *Hives*, made the *Bees* lazy (as before we noted) together with the unseasonableness of that year, that the *Bees* did not breed any more than to maintain their old Stock, so that my Experiment became fruitless. ^{Several Experiments to encourage Bees without swarming.}

Then presuming on that principle, that the *Bees* always begin their work above, and so work downwards, I took an old Stall of *Bees*, and long before breeding-time, inverted the same with the Skirts upwards, and the tops downwards, in an hollow Stool made for that purpose, and placed thereon one of my new wooden *Hives*, with *Glass-windows* thereto, having a bottom which covered the whole *Under-hive*, save onely a wide hole in the middle, through which the whole Stock of *Bees* had their passage in my new *Hive*, and so out at the door of my new *Hive*, they continually passed to and fro; In the Summer time when the *Under-hive* was over full they took to the top of the *New Hive*, and built there some few *Combs*; which before Winter when their number lessened, and the *Under-hive* was able to contain them all, they deserted, and did not according to my expectation forsake their old Stock, and take altogether to the *New*, although the same were above them, and the old one under them; But in all probability I had had a greater number of *Combs*, and a greater Stock of *Bees*, and they also would have continued longer, which would much have elucidated this experiment, had it not fallen out to be in such a year that few Stocks yielded any *Swarms*.

Another way I made use of was this, thinking the *Bees* would leave no place above them uninhabited, I cut off the top of a *Strawn-Hive* until I had made a passage through the top of the *Combs*, and thereon I placed one of my *Glassen-hives* with a bottom and a hole in the midst thereof, through which I used all the means I could to provoke the *Bees* to pass, but in no wise would they, for as soon as they were in the upper, though light by means of the glass, yet they immediately returned.

Also I placed several Stocks in *Strawn-hives* on *Wooden-hives* with *Glass-windows*, and left convenient passage out the one into the other, with a cover also to the hole that passed between the two *Hives*, which I might move at pleasure; I also stopped the doors of the *Strawn-hive* that they had no other passage, than through the *Wooden-hive*, wherein at Swarming-time they built many large *Combs* and stored them well with *Honey* (it being a good year for Breeding of *Bees* wherein I made this experiment) but when the cold weather came, and the number of *Bees* began to lessen, which they always do against the Winter, they crowded all up into the upper *Hives*, carried up or spent the *Honey* in the new *Combs*, and deserted them, leaving them as an empty Spectacle through the *Glass-windows*.

The one of these Stocks about Swarming time, having a good quantity of *Bees* in the under *Glass-hive*, I shut the passage between the upper and lower *Hive* with the shutter made for that purpose, and took away the upper Stock, and set it in another place, thinking thereby to have two Stocks for one (the *Bees* being as equally divided as might be) yet the *Bees* in the *under-hive* having lost their old passage, or not having their *King* or *Queen*, or for some cause or other, did not like their Habitation very well, but in two or three days were most of them gone into their old *Hive* or

or lost; which compelled me (for further tryal sake) to place the one over the other as before, so then they set again to their business, so that by any way hitherto Essayed, I cannot discover any way how to encrease my Stocks as to number, without giving them leave to Swarm, or go forth in Companies from their own homes (as it were) with their Prince or Leader to seek a new habitation.

But having thus far spent much time and labour to understand the nature of these wonderful and industrious Creatures, and finding these Attempts not to answer my expectation, I was unwilling to desist; the Errors of one usually leading to the discovery of another and better Experiment, but began a new way, and more probable than the other; which is, in every *Bee-hive* of wood with *Glass-windows* I had a large Pipe of about two inches square in the clear, that came from the top of my Hive to the bottom, open at both ends, at the bottom it was cut on the four sides, Arch-wise, that the *Bees* might on every side ascend freely up the Pipe, I fitted a piece of wood into this Pipe, to prevent the *Bees* from making any *Combs* therein; until such time as the Swarm put in it, should fill the *Hive*; then would I place another of the same sort and fashioned *Hives* on the top thereof, with his door open also, (having first taken out the stoppel fitted to the Pipe) that the *Bees* from the bottom of their own work might ascend through that Pipe into the newly placed *Hive*, which way when they had once discovered doubtless they would rather take to than swarm; by which means it is most probable you may multiply your Stocks, by placing *Hive* upon *Hive ad infinitum*, and drive your *Bees*, &c. which I had thoroughly proved, had not my removal prevented me, that I can promise you no assurance of the effect, but hope to give a better account thereof in a few years, discovering thus far of what I have seen and made experiment of, that you might either avoid those Difficulties and Errors I met withal, and proceed on such ways that succeeded well, and are in probability to answer what your desire is.

Where your design is for multiplication of your Stocks, there its best to make your *Hives* the smaller, and where you aim at great quantities of Honey, there make them the greater; so that in case you cannot prevail in the one, it may nevertheless be a considerable and sure Advantage in the other, as is evident in Mr. *Mewes* Experiment of his transparent *Hive*, out of one of which he took fourteen quarts of Honey, then its very probable the *Hive* held twice as much, for the Wax, *Bees*, and vacant places, so that his *Hive* was of an extraordinary bigness, and yielded an extraordinary Advantage.

*The bigness of
Swarms or
Stocks of Bees.*

Also in the other before-mentioned Experiment, the Orgonal Boxes or *Hives* are of a very great bigness, at least two foot wide, and of about fifteen inches deep, into which they put two Swarms together, which filled two of them in the first Summer.

Also in the History (*Butler* brings in his *Feminine Monarchy*) of the *Bees* that settled over *Vives* his Study, having so much room, what an incredible Mass of Honey was there produced!

There-

Therefore we cannot but urge this as a part of good Husbandry, to have a Set of well-made Hives transparent, or with lights of a good capacity, or to be added the one above the other, as we said before; although it be onely for the encrease of Honey, and another Set of smaller Hives onely for increase of Swarms; for a few Hives in a thriving condition, and well ordered, will yield you Bees enough to Stock many of your larger Hives.

Signs of
Swarming.

If the Spring be mild, calm, and showring, then is it good for Swarms, and they will be the earlier, but if it prove a cold, dry, and windy Spring, such as were 1665 and 1667, then will there be but few Swarms that year, and those also very backward.

About the middle of May in an early Spring you must begin to look after them, and observe what you can of the usual signs that precede their swarming, that you may be the more watchful over those that require it when the Hives are full (before which they will never Swarm) they will cast out their droves, yea although they be not quite grown: secondly, the Bees will hover about the doors in cold evenings and mornings: thirdly, there will be moistness and sweating upon the Stool: fourthly, they run hastily up and down; fifthly, they ly out in sultry evenings and mornings, and go in again when the Ayr is cleer.

Signs of pre-
sent Swarming.

If the Weather be warm and calm, the Bees delight to rise, but especially in a hot gleam, after a showr or gloomy Cloud hath sent them home together, then sometimes they first gather together without at the door, not onely upon the Hive, but upon the Stool also, where when you see them begin to hang in Swarming-time and not before, then be sure they will presently rise if the weather hold.

Signs and cau-
ses of not
Swarming.

To ly forth continually under the Stool, or behind the Hive, &c. especially towards the middle of June, is a sign or cause of not swarming; for when they have once taken to ly forth, the Hive will always seem empty, as though they wanted company, then will they have no mind to swarm.

Also much stormy and windy weather, will not suffer them to Swarm when they are ready, and that makes them ly out, and the longer they ly out, the more unwilling they are to Swarm.

Another cause of their lying forth, is continuall hot, and dry weather, especially after the Solstice, which causing plenty of Honey both in Plants and Dews, their minds are so set upon that their chief delight, that they have no leisure to Swarm, although they might most safely come abroad in such weather.

To make them
Swarm.

First keep the Hive as cool as may be, by watring and shadding both it and the place where it standeth, and then enlarging the the door to give them Ayr, move the Cluster gently with your brush, and drive them in.

If yet they ly forth and Swarm not, then the next calm, and warm day about noon, whilst the Sun shineth, put in the better part with your brush, and the rest gently sweep away from the Stool, not suffering them to cluster again, these rising in the calm heat of the Sun, by their noise as though they were Swarming, will

will make the other to come forth perhaps unto them, and so they may Swarm.

If this serve not but they ly forth still, then rear the *Hive* enough to let them in, and cloom up the *Skirts* all but the door; If this succeed not, there is no remedy.

The signs of *After-swarm* are more certain, when the *Prime-swarm* is gone, about the eighth or tenth evening after, when another brood is ready, and again hath overfilled the *Hive*, the next *Prince* beginneth to tune in her treble voice, a mournful and begging note; Then in a day or two shall you hear the old *Queen* in her *base Note* reply, and as it were consent; In the morning before they Swarm, they come down neer the *Stool*, and there they call somewhat longer, at the very time of *Swarming*, they descend to the *Stool*, where answering one another in more earnest manner, with thicker and shriller notes, the multitude come forth in great haste, &c.

Signs of after-Swarms.

If the prime Swarm be broken, the second will both call and Swarm the sooner, it may be the next day, and after that a third, and sometimes a fourth: but all usually within a fortnight; sometimes also a Swarm will cast another that year.

When the Swarm is risen, it is the usual custom to play them a fit of *Mirth* upon a Pan, Kettle, Bason, or such like Instrument, upon pretence to gather them together, and make them settle, which custom seems to be very ancient as *Virgil* witnesseth.

Ringings of Bees.

Tinnitufque cie, & matris quate cymbala circum, &c.

And notwithstanding this hath been accounted, and found to be needless, and by *Levet* in his treatise of *Bees* esteemed as a ridiculous toy, and most absurd Invention, and rather hurtful than profitable, because all great noise doth disquiet and hurt them, he saith he had above four Swarms in a year, without the loss of one, when his Neighbours having a far less number, and using this kinde of Juggling, lost divers; also *Butler* makes no other use of it, than where there be many *Apiaries* neer, publickly to notifie the time and place of their rising, that so a just and open claim may be laid unto the Swarm, esteemed the pretended reason of staying the Swarm to be a meer fancy.

But if they fly aloft, or are like to be gone, cast dust amongst them to make them come down.

When your Swarm hath made choice of a lighting place, you shall quickly see them knit together, in form of a *Core*, *Pinaple*, or *Cluster of Grapes*, when they are fully settled, and the *Core* hath been a while at the biggest, then *Hive* them.

Moving of Bees.

First (having in store several *Hives* of several bignesses) make choice of a *Hive* proportionable in bigness to your *Swarm*, that the *Bees* may go neer to fill it that year: but rather under *Hive* a *Swarm* than over *Hive* them.

Then rub the *Hive* with sweet Herbs, as *Thyme*, *Savory*, *Marjoram*, *Banlm*, *Fennel*, *Hyfop*, *Mallows*, *Bean-tops*, &c. and with a branch of *Hasel*, *Oak*, *Willow*, or any other of the aforesaid Herbs, but rather of the same Tree whereon the Swarm lighted; wipe the

the *Hive* clean, and dip such sprig or branch into *Metb*, or fair water mixed with a little *Honey*, or with *Milk* and *Salt*, or *Salt* onely, and therewith besprinkle the *Hive*.

Then having first drank a cup of good *Beer*, and washed your hands and face therewith, or being otherwise defended, if the *Bees* hang upon a bough, shake them into the *Hive*, and set the same upon a *Mantle* or *Cloath* on the *Ground*, as is usual, or you may cut off the Bough if it be small, and lay it on the *Mantle* or *Cloath*, and set the *Hive* over it, which is the better way.

If they light neer the ground lay your *Cloath* under them, and shake them down, and place the *Hive* over them, and such *Bees* that gather together without the *Hive*, wipe them gently with your brush towards the *Hive*, and if they take to any other place than the *Hive*, wipe them off gently with your brush, and rub the place with *Mugwort*, *Morgan*, *Wormwood*, *Archangel*, or other bitter or noisome Weeds, or Herbs.

Then let the *Swarm* as neer as you can to the lighting place, till all be quiet, and every one knows his own home.

If the *Swarm* part and light in sight one of another, let alone the greater, and disturb the lesser part, and they will fly to their Fellows; but if not in sight, then *Hive* them both in two several *Hives*, and bring them together, and shake the *Bees* out of the one *Hive*, on the *Manile* whereon the other *Hive* stands, and place the other full *Hive* on them, and they will all take to it.

Uniting of
Swarms.

If it happen that your *Swarms* come late, after the middle of *June*, and that they are small, under the quantity of a peck, then put two or three of them together, whether they rise the same day or in divers; for by this uniting they will labour carefully, gather store of wealth, and stoutly defend themselves against all enemies. The manner of uniting is thus.

In the evening when it waxeth dark, having spread a *Mantle* on the ground neer unto the *Stool* where this united *Swarm* shall stand, and set a pair of *Rests*, or two supporters for the *Hives*, knock down the *Hive* out of which you intend to remove your *Bees*, upon the *Rests*, then lifting up the *Hive* a little, and clapping it between your hands to get out the *Bees* that stick in it, lay it down side ways by the *Bees*, and set the *Stock* or *Swarm* to which you would add them, upon the *Rests*, or Supporters over them, and they will forthwith ascend into the *Hive*, those that remain in the empty *Hive* by clapping it will hasten after their company, then when you have gotten them all in, either that night or early in the next morning, place the *Hive* on the *Stool*, &c.

A better way.

Place the *Hive*, wherein you have newly put your *Swarm* you intend to drive into another, in a place that the *Skirts* may be uppermost, and set the other upon him, binding them about the *Skirts* with a long *Towel*, and so let them stand till the morning, and the *Bees* will all ascend, that you may the next morning set the *Receiver* on a *Stool*, and thus may you put three or four *Swarms* together, but observe to unite them the same evening or the next at farthest, that they *swarm*, lest having made *Combs*, they are the more unwilling to part from them.

In

In these several ways of dealing with *Bees*, it is good to defend ones self as well as may be against their stinging, which to some persons proves very troublesome, especially if they are uncleanly, or have any ill scent about them, therefore with caution must they be tampered withal; Some onely drink a Cup of good Beer, and finde that sufficient, others wash their hands & face therewith, which proves a good defence, I have gone amongst them in their greatest *Anger* and *Madness*, onely with a handful of *sweet Herbs* in my hand, fanning about my face, as it were to obscure and defend it, also if a Bee do by accident buze about you being unprovided, thrust your face amongst a parcel of Boughs or Herbs, & he will desert you; But the most secure way of all, and beyond the compleatest *Harnesse* yet published, is to have a *Net* knit with so small *Meshes* that a Bee cannot pass through, and of fine *Thred* or *Silk*, large enough to come over your hat, and to lie down to the collar of your *Doublet*, through which you may perfectly see what you do without any danger, having also on a good pair of *Gloves*, whereof *Woolen* are the best.

But if the Bee happen to catch you unawares, pull out the sting as soon as you can; Some prescribe to wash the same with your spittle, and say that that will prevent swelling, others commend the rubbing thereon the *Leaves* of *Marigolds*, *Honfeleek*, *Rue*, *Mallows*, *Ivy*, *Holyhock* and *Vinegar*, *Salt* and *Vinegar*, and divers other things, but the most sure & natural remedy is to heat a piece of *Iron* in the fire, or for want of that to take a live *Cole*, & hold it as neer and as long to the place as you can possibly endure it; which will sympathetically attract the fiery venom, that by the sting was left in the wound and give you an immediate ease and cure; the same it will effect on the bitings or stings of *Snakes* or other venomous Creatures, and its probable on the bitings of mad *Dogs*; but of this in another place.

As soon as a *Swarm* hath entered his *Hive*, they immediately (if the weather permit) gather *Wax* and build *Combs*, that in a few days time there will be several large and compleat *Combs*; they ly so thick about them, that its impossible one quarter of them can be employed at once, untill the *Combs* are brought to a considerable length, and then a great part of them may be employed in filling them, the rest in finishing their *Cells* or *Combs*.

Its a difficult matter in our *transparent Hives*, to discern how these admirable Creatures frame their curious Workmanship, by reason they are so numerous, that they generally cover their whole Work, that unless the *Bees* also were transparent (as *Buller* terms it) it cannot be discerned; But through the *Glass* you may observe how they carry up their far fetch goods, and what a mighty stir they make, and how perpetually busie they are, and in a cleer day when most are abroad, especially towards the end of the Summer, also when their young *Bees* are fit for service and are abroad we are those chiefly that hide so much of the *Combs*) then may you plainly discern their *Combs* & *Cells* filled with bright & cleer *Honey*.

Their numbers also towards the end of the Summer, begin to lessen, which gives you a great advantage of beholding them and their work; For in their prosperity at *Swarming-time*, and shortly

after, they are far more in number than in the *Autumn*, or *Winter*, as you may easily discern between the quantity and number of a *Swarm*, and those you kill when you take them; For the *Bees* of the last years breed, do now by degrees waste and perish, by their extraordinary labour their wings decay, and fail them; So that a year with some advantage is the usual age of a *Bee*, and the young only of the last *Spring* survive and preserve the *kinde* till the next.

Of the Bees
Enemies.

There are several things that are injurious to *Bees*, and much hinder their prosperity, if not prevented.

1. *Noise*, which may in part be remedied by the scituation of the *Apiary*, free from the *Noises* of Carts and Coaches, the sound of *Bells*, from *Ecchoes*, &c.

2. *Smok*, I have known that when Land hath been burn-baited near unto an *Apiary*, and the winde brought the smoak towards it, that a great part of the *Bees* intercepted by the smoak in their flight, have been destroyed, which is a principal cause that *Bees* thrive not in, or near a great Town.

3. *Ill Smells* also are very offensive to them, as before we noted.

4. *Ill Weather*, as *Winds*, *Rain*, *Cold*, *Heat*, &c. prevented by the scituation and fencing the *Apiary*, and ordering the *Stocks*, as before.

5. The *Mouse*, *Birds*, and other devouring Creatures, which are to be destroyed, as hereafter we shall shew you.

6. *Noisom Creatures*, as *Toads*, *Frogs*, *Snails*, *Spiders*, *Moths*, &c. which you must endeavor to keep out of your *Apiary*, and also cleanse your *Hives* ever and anon from these *Vermine*.

7. *Hornets* and *Wasps*, in such years wherein they abound, prove great enemies to the *Bees*, by robbing them of their wealth, which are destroyed by placing near the door of the *Hive* a glass *Vial* half full of *Cider*, *Verjuice*, *sowre drink*, or such like, wherein they go and never return.

8. *Bees* themselves prove the greatest enemies, both by *fighting* and *rabbing*. Several occasions provoke the *Bees* to fight, which if the battel be but newly begun, may be hindred by stopping up the *Hive* close, where they begin to fight; or if it be so far gone that most of the *Bees* are out, and that the Conflict is very great, the casting up of dust amongst them was the ancient way to pacifie them, as *Virgil* witnesseth:

*Hi motus animarum, atque hæc certamina tanta
Pulveris exigui jactu compressa quiescent.*

But *Butler* condemns this Custom, and also of casting drink amongst them.

To keep and preserve your *Bees* from *Robbers*, which are very usual both in the *Spring* and *Autumn*, you must be sure to cloom up the *Hives* very close, leaving the doors very small, and according to the season of the year to widen, and streighten them, as you may observe in the *Kalendar* towards the end of this Book inserted.

The best time to remove an old Stock, is a little before, or a little after *Michaelmas*, or if you have overslipt that time, then about the end of *February*, or beginning of *March*, before they go much abroad, lest it prevent their Swarming; or you may remove any time of the Winter, though not so well as in the aforesaid Seasons.

For the removing of a *Swarm*, its best to do it the evening next after the Hiving.

Let the Weather be fair as near as you can when you remove, and let it be done in the Evening, when all the *Bees* are quiet.

The best way is thus, Take a board about the breadth of the bottom of the *Hive* you intend to remove, and in the evening, or two or three evenings before you remove your Stock, lift it up and brush the *Bees* that are on the Stool forwards, or let the board be a little supported by two ledges, to prevent the death of the *Bees* on the Stool; on this board set your Stock, and so let them stand till you remove them, when you come to remove them, stop up the door of the *Hive*, and set the board whereon the *Hive* standeth on a *Hand-barrow*, and carry them to the place you intend, and there place them, by which means they are not at all disturbed, nor a *Bee* injured, nor the *Hive*, nor *Combs* crushed by the squeezing of the Cloath, nor yet a Cloath used about them.

This of all other things belonging to an *Apiary* is of least use, first because *Bees* that have not a probable stock of Honey to serve them over the Winter, are not fit to be kept; And then because they that are *Bee-masters*, and have not care enough of them to keep them from spending that stock they have in the Winter time, must not expect to reap any considerable Advantage by this profitable Creature, nor I presume will ever take so much pains and care as is required in feeding them.

Yet are there some Stocks of *Bees* in the Spring time, that may seem worthy our care to preserve them, viz. Such that having but a thin stock of Honey, and a good quantity of *Bees*, by means of a cold, dry, and unseasonable Spring cannot make such timely provision, as in other years they might have done, yet in all probability may prove an excellent Stock. It would prove a piece of gross neglect of our own advantage, and a piece of cruelty to these distressed Animals, if we should not lend our assistance.

Which may be several wayes applied, but best by small Canes or Troughs conveyed into their Hives, into which you may put your Food you give them, which must be daily continued till the Spring season affords them easie and sufficient provision abroad, because at that time their Combs are full of young *Bees*.

Of all Food, Honey is the best and most natural, which will go the farther if it be mixed well with a moderate proportion of good sweet Wort; some prescribe toasts of Bread sopped in strong Ale, and put into the *Bee-hive*, whereof they will not leave one crum remaining: some also advise to put into the Hive dry Meal or

Flour of Beans, others Bay-salt, roasted Apples, &c. which are all very good.

An experiment
for improving
of Bees.

Take a handful of *Baum*, one dram of *Camphire*, half a dram of *Musk* dissolved in *Rose-water*, as much yellow *Bees-wax* as is sufficient, Oyl of *Roses* at much; stamp the *Baum* and *Camphire* very well, and put them into the *Wax* melted with the Oyl of *Roses*, and so make it up into a *Mass*, let it cool before you put in the *Musk*, for otherwise the heat will fume away most of the scent of it.

Take of this *Mass* as much as an *Hazel-nut*, and leave it within the *Bee-hive*, it will much encrease the number of your *Bees*; You shall also find both in *Honey* and *Wax* three times more profit than otherwise you should have had. *Commonwealth of Bees.*

A singular ob-
servation con-
cerning the
food of Bees.

In *Kempen-land* in *Germany* (saith mine Author) I have seen about forty great *Bee-hives*, which contain when they are full about seventy pound weight in *Honey*, placed near a great Field sown with *Buck-wheat*; And it was related to me of a truth by the Inhabitants, that the *Bees* did suck such plenty of *Money* out of it, that in a fortnights time the said *Hives* were all filled therewith.

Also *Annise-seed* sown near the *Apiary* is esteemed an extraordinary delightsoom food for *Bees*.

Of the fruit
and profit of
Bees.

The principal aim of the most *Bee-masters* is advantage, and it hath been the general design of Experimenters to discover which way this most industrious and profitable Creature may be multiplied and maintained with the least expence, care, and trouble, and also to the greatest Advantage; For they require no more than a House of Straw, unless you can afford them a better; their Food they seek where it will never advantage you, nor any else, if they have it not: Your circumspection and care onely is required to order and preserve them, which also is but little if you understand their natures and temper, and wil seem much less if you make it one of your Exercises of delight and pleasure.

Yet do they return you an extraordinary recompence and reward for what ever you bestow on them, as before we have observed.

But that which hath been principally designed, is to finde out some ways or means how, or after what manner the Fruit and Profit of Bees may be taken without the loss of their Hives, it being a seeming act of Cruelty to destroy the Lives of these most industrious Creatures, to rob them of their goods.

Driving of
Bees.

The one way that hath been used to this purpose, is the driving of *Bees*, after this inanner: In *September*, or any time after they have done breeding, else will the *Honey* be corrupted by the *Skaddons* in the *Combs*, place the *Hive* you intend to take with the bottom upwards, between three or four stakes, and set the *Hive* you intend to drive the *Bees* into, over the same, as before we directed in the uniting of *Swarms*, then often clap the Under-hive between your hands in the evening, and so let them stand till the morning, and then clap it again; and set the full *Hive* on the *Stool*, a little bolstered

bolstered up, that the *Bees* may have free egress and ingress, then clap the empty *Hive* again, and get as many *Bees* out as you can, which will repair to the other *Hive*. This way is something troublesome to the unexperienced, yet beneficial, in such cases where you have a great stock of *Honey*, and few *Bees* in one *Hive*, and a small stock of *Honey* in another, by which means you save the lives of most of your *Bees*, which will gladly exchange their hungry habitation for a more plentiful.

This is a way hath been practised by the Ancients, and hath been much endeavoured after to be revived again, though not with any good success; for if you take away any part of their Combs in the *Spring*, they are then full of *Skaddons*, which spoil the *Honey*, and also destroy the breed of your *Bees*; if you take away the Combs in the *Autumn*, then will they want them in the *Spring* following to lay their young in, which they usually do before any new matter is to be found to build new withal.

Excellion, or
gelling of
Combs.

So that the new Inventions of making *Bee-hives*, to open with doors, to take out Combs at pleasure are fruitless, and ridiculous toys published by such that know not the nature of *Bees*, nor their work; who fix their Combs on every side that you cannot easily open your door, and if you could the *Bees* would prove too busie for you to meddle with their Combs, whom if you should overcome, yet the former inconveniencies would succeed.

Others have advised to make *Bee-hives*, to place the one over the other, and some to be placed the one at the end of the other successively, that when the *Bees* have filled the one, another being added they would fall to work, and fill the next, and leave the former, and so fill several one after another, and that you may take the *Hive* that was first filled away, for your use; and have also described unto us the particular ways of ordering these new invented *Hives*, and how every particular thing is to be done, as though the Authors thereof had had long experience in it, which hath encouraged many to the prosecution of the design.

Which I find to deceive us in several particulars; for the *Bees* build Combs onely at the former part of the Summer, and after they have prepared sufficient *Receptacles* wherein to dispose their *Honey*, and answerable to their number, their matter also being much wasted, which they gather abroad for the making of their Combs, they then fall to work for the storing of their *Cells* with food for the approaching Winter, so that whatever room you give them more seems superfluous, and rather proves a burthen than an Advantage unto them; the next year also its in vain to give them more room unless it be to a young Stock, that could not, or had not time enough to build sufficient the precedent year, or to an old Stock that was streightned in room before, as usually our swarming Stocks are.

Also when you expect to take the top or fullest Combs, your expect gain, you will finde the *Bees* most there; for they will not (as some fondly imagine) desert the more remote, and ly in the neerer Combs, but on the contrary, as I here often found.

But

But that which seems to me the most probable way (for I have not yet fully experienced it) is to make your *Hives* very small, either the one over the other, or the one behind the other, and if you finde they have a sufficient stock of *Honey*, to preserve them in the remainder, you may take the most remote *Box* or *Hive* and place it the neathermost, and so drive the *Bees* into the other, but this also must be submitted to farther tryals.

To conclude from what we have before treated, I judge it the most prudential way to have in your *Apiary*, a sufficient stock of *Bees* kept, for breeding and swarming, and another stock kept in large *Glass-hives*, whereof we have before discoursed; for the raising of great quantities of *Honey*, which they will much better do in those *Hives*, and I see no reason why we should judge it a greater piece of cruelty, or inhumanity to take away the lives of these *Creatures* (who have so short and insensible a life, and die so easily) for their *Honey*, than to take away the *Lives* of any other *Animals* to feed on their *Carkases*, which is daily done, and that with very high degrees of torture; Neither can it be any loss to the *Bee-master*, who may have an Annual supply by his swarming stocks, kept for that purpose, as the great *Flocks* of *Weathers* are yearly supplied from the *Flocks* of *Ewes*, and the large and vast fatning *Ponds* of *Carps*, from the lesser breeding *Ponds*.

Virgil.

Sed si jam proles subito defecerit omnis,

Nec genus unde nova stirpis revocetur, habebit :

Which rarely happens to a careful *Bee-master* : but if it should

Idem.

Tempus & Arcady memoranda inventa Magistri,
pandere.

Generation of
Bees.

Then may you experiment the Invention of the *Athenian Bee-master* in *Virgil*, wherewith in effect agrees the Experiment of our modern and great Husbandman, old Mr. *Carew* of *Cornwal*, which is thus, take a *Calf* or *Steer* of a year old, about the latter end of *April* ; bury it eight or ten days till it begin to putrifie and corrupt, then take it forth of the Earth, and opening it lay it under some Hedge or Wall, where it may be most subject to the Sun, by the heat whereof it will a great part of it turn into *Maggots*, which without any other care will live upon the remainder of the corruption, after a while when they begin to have wings, the whole putrified *Carkass* would be carried to a place prepared where the *Hives* stand ready, to which being perfumed with *Honey*, and sweet Herbs, the *Maggots* after they have received their Wings, will resort.

Virgil.

Quis dens hanc Musa, quis nobis extudit Artem ?

Unde nova ingressus hominum experientia cepit ?

Or if you are unwilling either to credit or make tryal of this experiment, you may purchase a new stock of your Neighbours, if not with money, which is counted unfortunate, yet with the exchange of other Commodities; But what need we make provision against so improbable and unlikely Accidents.

For the trying of *Honey* and *Wax* we will leave to the experienced.

There

There are several ways of making curious Drinks or Liquors out of Honey, some make it white and cleer not onely by the pureness and fineness, and whiteness of the Honey, but also by some particular Process or Art they have, others make it very good, yet partly by reason of the nature and colour of the Honey, and partly for want of judgment, it carries with it a more gross and red tincture, but if the Honey be good, the tincture cannot be much injurious to the Drink.

Concerning the making whereof we have met with some few Directions, which we shall here insert.

A Receipt to make a pure Mead that shall taste like Wine.

Take one part of clarified Honey, and eight parts of pure Water, and boyl them well together in a copper Vessel, till half the Liquor is boyled away: but while it boyls you must take off the Scum very clean, and when it hath done boyling, and begins to cool, run it up and it will work of it self, as soon as it hath done working you must stop the Vessel very close, and bury it under ground for three moneths, which will make it loose both the smell and taste of the Honey and Wax, and will make it taste very like Wine.

Another proportion.

Take of Honey clarified twenty pound, and of cleer Water thirty two gallons, mingle them well together, and boyl that Liquor half away, and take off the Scum very clean, &c. and if you will have it of an Aromatick taste, you may add this proportion of ingredients, viz.

Flowers of Elder, Rosemary, and Marjerom, of each an handful, of Cinamon two ounces, of Cloves six ounces, of Ginger, Pepper and Cardamom, each two scruples, these will give it a pleasant taste.

Another proportion thus.

To a dozen gallons of the Scummed Must, take Ginger one ounce, Cinamon half an ounce, Cloves and Pepper of each alike two drams, all gross beaten, the one half of each being sowed in a bag, the other loose, and so let it boyl a quarter of an hour more.

Some mix their Honey and Water till it will bear an egg, by which Rule you may make it stronger or smaller at pleasure.

Another proportion of Ingredients.

To sixteen gallons of Must, take Thyme one ounce, Eglantine, Marjerom, Rosemary, of each half an ounce, Ginger two ounces, Cinamon one ounce, Cloves and Pepper of each half an ounce, all gross beaten the one half boyled in a bag, the other loose, &c.

Of Silk-worms.

THis, though but a *Worm*, yet glorious *Creature*, seems by the Relation of credible Historians, to be but a modern *Operator* in these *Northern Countrys*, of that excellent Commodities *Silk*, and these *Worms* also are not so much encreased nor improved (especially here in *England*) as they might be, every one almost is willing to undergo the trouble, and enjoy the pleasure and benefit of feeding and preserving them, were there but *Food enough* here for them, the deficiency whereof is the onely *Remora* that impedes this most noble enterprize.

Their food.

The *Mulberry-leaves* are the principal, and I beleve the onely Food that will cherish and feed these *Worms* to Advantage at least in these *Countrys*, whatever some write to the contrary, as that at *Dublin* in *Ireland* the *Worms* have fed on *Lettuce* very readily, and that they grew as big as those that were fed with *Mulberry-leaves*, and did spin as much *Silk*, eating also no other Food, and that they will eat the Herb called *Dandelion*, others have tryed that way of feeding them with *Lettuce*, and not found the success answerable, some also affirm that they will thrive on *Poplar-trees*, *Plum-trees*, and *Apple-trees*; The certainty whereof we leave to be decided by experience: but I see little reason for it, the *Silk-worm* being onely an *Insect*, and that it is generally the nature of *Insects* to feed on some certain specifical matter, therefore the onely and principal way that is to be attempted for the propagating of this design, is for some publick spirited Persons, to lay out some certain places of their Lands for the raising of *Mulberry-trees*, as before in our discourse of *Fruit-trees* we observed.

Time and manner of hatching
Silk-worm
eggs.

About the beginning of *May*, when the *Mulberry-tree* begins to spread its Leaf, is the time the *Silk-worm* eggs are as it were by nature adapted; for a release from their long confinement, that if you lay them in some window in the warm *Sun*, or carry them in a little box between some pieces of *Say*, in some warm place about you, keeping them also warm in the night, they will soon appear in a new form, then cut some paper full of small holes, and lay over them, and over that some of your young *Mulberry-leaves*, and these small *Worms* will easily finde their way to their natural Food, and so as fast as they are hatched, they immediately apply themselves to the Leaves, After they are thus betaken to the Leaves, you may place on them Tables or Shelves, at convenient distances, according to the number of your *Worms*, and proportion of place you have for them.

Their sickness.

They are sick four times in their feeding, the first commonly about twelve days after they are hatched, and from that time at the end of every eight days according to the weather, and their good or ill usage, during which time of every sickness which lasteth two or three days, you must feed them but very little, onely to relieve such of them as have past their sickness before the rest, and those that shall not fall into their sickness so soon.

The

The whole time of their feeding is about nine weeks, during which time you may feed them twice a day by laying the Leaves over them, as it were to cover them, and they will soon finde a way through them, and as they grow in strength and bigness, so may you feed them more plentifully and often, it is good to let the Leaves be cleer of *Dew* or *Rain*, before you give them unto the Worms, you may keep them spread on a Table in case they be wet, you may gather and keep them two or three days, without any great inconvenience, in case you live remote from *Mulberry-trees*, or the weather prove casual.

The time and
manner of
feeding.

You must observe to rid often their Shelves of their dung, and the remainders of the Leaves, by removing the Worms, when they are fast on the new Leaves laid on them, for then may you remove easily the Worms with the Leaves, the keeping clean of the Shelves, and the Room being a principal means to preserve them. Also remember to keep their Room warm in cold and wet weather, and to give them a little cool Air in hot weather.

Let not the Room you keep them in be too near the Tiles on the top of your house, nor in any cold, or moist Room below, but be sure to avoid all extreams.

When they have fed as long as they are able, they look of clear and Amber-colour, and are then ready to go to work, therefore it is then advised that you make *Arches* between their Shelves with *Heath* made very clean, or with Branches of *Rosemary*, Stalks of *Lavender*, or such like, whereupon the Worms will fasten themselves, and make their Bottoms, which in about fourteen days are finished.

Their spinning.

But the onely way that I have seen practised, and the best way is to make small *Coves* of Paper, and place them with their sharp ends downwards in Rows, in each of which put a *Worm*, as they appear to you to be ready to go to work, and there will they finish their Bottom more compleat, and with less waste than on any Branches whatever.

When they have finished their Bottoms, which will be in about fourteen days, then take so many as you intend to reserve for Breeders, and lay them by themselves, and the *Worms* within will eat their way out in four or five daystime; and when they come forth, it is advised that you put them together on some piece of old *Say*, *Grogeram*, the back-side of old *Velvet*, or the like, made fast against some Wall, or Hangings in your House; but I have known them succeed very well on Tables, &c.

Their breeding

Then will these Flies ingender, and the Male having spent himself dies, and so doth the Female after she hath layen her Eggs; then take the Eggs up with the point of a Knife, or such like, and put them into a piece of *Say*, or such like, and keep them in a Box amongst Woollen Cloathes, or such other dry, and not warm place till the next Spring; One of these Females will produce some hundreds of Eggs, therefore a few kept for Seed or Increase will be sufficient, the residue put into an Oven after the baking of Bread, &c. that it may be onely hot enough to kill the *Worms*,
E e for

*The winding of
the Silk.*

for their gnawing their way out is some prejudice to the bottom.

When you have obtained your Bottoms take off the Baggs, and having found their ends, put six, ten, or more in a Bason of water together, where a little *Gum-Tragacanth* is mixed, and so you may easily winde them, the small hairs of Silk seldom break, but if they do, they are easily found again; If the Worms are not well fed, the Silk is small and easily breaks.

Another way to make these Gummy Bottoms winde easie is this, Take *Soap-boylers Liquor*, or *Lee*, which is very sharp and strong, and put therein your Bottoms, and set them over the fire till the Liquor be scalding hot, and so let the Bottoms remain therein about half a quarter of an hour, till the Gumminess be dissolved, then put the Bottoms into clean scalding water, and let them lye a while therein, then will they unwind with much facility. A Lixivium made of Wood-ashes very strong, will do as well as the aforesaid Soap-boylers Liquor.

There is a kinde of Tow, or rough sort of Silk that will not winde up with the other, which may be prepared, and good Silk made thereof, and indifferent also of the Baggs themselves.

The fine Skeins themselves after they have past through the Scowrers, Throsters, and Dyars hands, may compare with the finest.

C H A P. X.

Of the common and known external Injuries, Inconveniences, Enemies, and Diseases incident to, and usually afflicting the Husbandman, in most of the Ways or Methods of Agriculture before treated of; And the several Natural and Artificial Remedies proposed and made use of for the prevention and removal of them.

Since the exclusion of our first *Parents* out of the state of Bliss or Paradiſe, all our Actions, Endeavours, and Enterpriſes, have been ſubject to the Various and uncertain Diſpoſitions of an over-ruling Providence, and alſo of Fortune and unexpected Chances and Accidents, and more eſpecially the ſeveral Actions, Employments, and Induſtries that are incident, and belonging to this noble Art of *Agriculture*, and its ſeveral branches before treated of, that no one exerciſed in *Husbandry* can promiſe himſelf an *Indemnity* from the uſual miſfortunes that attend it, which is the cauſe that at ſome time, that very Commodity is dear and ſcarce, which at another time is cheap and plentiful, and that ſome Huſbandmen have excellent Crops, and good ſucceſs at the ſame time, when others have the contrary.

Theſe very conſiderations have not onely ſtirred up the *Ingenious* to conſider of the *Diseases* and *Injuries* themſelves, but alſo to ſeek after the means to avoid thoſe that of neceſſity attend them, and to prevent ſuch that may be prevented, which we finde diſperſed in ſeveral Authors, and alſo finde to have been made uſe of by many of our *Modern Ingenious Ruſticks*, and not yet made publique, and firſt we will diſcourſe of ſuch *Injuries* and *Inconveniences* that proceed

Sect. I.

From the Heavens, or the Air.

This *Iſland* is generally ſubject to great heat or drought in the Summer time, which ſo much exſiccateth and waſteth the moiſture and vegetative nature of the Earth, that much of our common Field or open Land yields but a reaſonable crop of Corn, nor our open and wide Paſtures or dry Lauds, much Graſs or feeding for Cattel, yet are theſe dryeſt Summers moſt propitious unto

Great heat or drought.

In Corn Lands.

us, and in them do we reap the most copious Crops, but it is because we have so much low grounds under the Shelter, and so many enclosures defended from the destructive and sweeping Summer *Airs*, where in those dry years we have our richest Harvests, so that Nature it self, and common experience, hath chalked out unto us a remedy for our dry, barren, and hungry Lands and Pastures, whether common or appropriate, against heat and drought, the two principal Inconveniencies attending those Lands, if we had but the hearts of men to make use of it, it is said that in *Cornwal*, they begin to practise this Husbandry, and plant *Mounds* and *Fences* with timber Trees, which growing tall do much preserve the Land from malignant *Airs*, and yields a great profit besides: see more of this remedy before in the Chapter of Enclosures.

In planting
Trees.

Heat or *Drought* also produces more particular Inconveniencies or Injuries, as to Trees sown or planted abroad in the open Fields, or in Enclosures, Gardens, &c. which is a very great check or impediment to the Husbandman in propagating them, the preventions or remedies whereof are several.

1. In the dryest and most barren Lands in *England* if you sow the same with the Fruit or Seed of Oak, Ash, Beech, or any other wood whatsoever, you may also sow the same Land at the same time, with *Broom*, *Furze*, or such like, which will wonderfully thrive on the worst of Land, and become a shelter to the other Trees, which when once they have taken sufficient Root, will soon outstrip the *Furze* or *Broom*, or you may raise Banks, and sow them with *Furze*, which will soon make a Fence, under the shelter whereof you may nurse up other Trees, for it is most evident, that the greatest Trees that grow on the barrenest Lands, had their original in the same places where they grow, and is most probable that they were thus defended by some small Bush or Brake from Cattel, Heat, Cold, &c. till they arrived to such height that they could defend themselves.

2. For such Trees that are usually planted in Hedge-rows or other places of Enclosures, &c. which the heat and drought doth either impede their growth or totally kill them, to the great discouragement of the Planter; Add to the Roots of them on the surface of the Earth, a heap of stones, which is the best additament and will keep the Roots and ground about it cool and moist in the Summer, and warm in the Winter, and fortifie the Tree against Winds, &c. but where stones are not easily attained, heaps of *Fern* or any other Vegetable, *Straw*, or *Stubble*, &c. will preserve the ground moist and enrich it withal, but where neither Stones nor Vegetables can be had conveniently, after the Tree is planted and good Mould or Earth added to the Roots, raise a hillock about it of any manner of *Turf*, *Earth*, &c. for it is not the height of the *Earth* above the ground about the Tree that injures it so much as the depth of the Tree below the surface or best Earth.

3. In Gardens and such neer places where you may be at hand, and where you have choice Plants that suffer by heat, shadow is a principal remedy, as before we noted, or Water in such places where it may be commanded.

In

In several places *Water* is the principal thing deficient to make them pleasant and profitable, and the means whereby to procure it very tedious, costly, and difficult; It is several ways attainable. *Remedies for want of Water.*

1. By sinking of *Wells*, which where they are very deep, some use a large Wheel for Man or Beast to walk in, to raise it, others use a double Wheel with coggs, which makes it draw easier than the ordinary single Wheel, but this is not so good a way as the double Wheel with *Lines*, the *Line* of the Wheel at your hand being small and very long, this raiseth a large Bucket of Water with very much ease and security to the *Winder*, the Method being usual needs no description here.

2. By bringing water in *Pipes* or *Gutters*, which is easily done; the Spring or Stream from whence you bring it being somewhat higher than the place where you desire it.

3. By raising water by *Forcers*, *Pumps*, or *Water-wheels*, many and several are the Inventions whereby to effect it: but none more easie, plain, and durable, than the *Persian-wheel*, before mentioned in the *Chapter* concerning the watering of Meadows.

4. By making of *Cisterns* or *Receptacles* for Water, either for the Rain or some Winter-springs to fill them, whereby the Water may be kept throughout the Summer; In this are we very deficient; for on the Mountainous dry and upland parts of *Spain*, they have no other Water, than what they so preserve from the Rain.

Also in *Amsterdam* and *Venice*, they keep their Rain-water in *Ce-lars* made on purpose for *Cisterns*, capacious enough to contain Water for the whole year, it being renewed as oft as the Rain falls, why therefore may we not here in *England* on our dryest Hills make Places, Pools, or *Cisterns* sufficient to contain Water enough for our Cattel, for our domestick uses, and also for our Garden occasions, if we were but diligent; few years there are but yields us plenty of showrs to supply them, though not enough to supply the defect of them, much more Rain falling here, than on the Continent where those Pools and *Cisterns* are more used, for which cause this *Island* is by them termed *Matula Cels*, and yet have we so many thousands of Acres of dry Lands uninhabited, untilld, and almost useles unto us from this onely cause, and have so easie means to remedy it.

If you design to make your *Cisterns* under your house as a *Cellar*, which is the best way to preserve it for your *Culinary* uses, then may you lay your Brick or Stone with *Tarris*, and it will keep Water very well, or you may make a Cement to joynt your Stone or Brick withal, with a composition made of slacked and sifted *Lime* and *Linseed-oil*, tempered together with Tow or cotten Wool. *How to make Cisterns to hold Water.*

Or you may lay a bed of good Clay, and on that lay your Brick for the Floor, then raise the Wall round about, leaving a convenient space behind the Wall to ramn in Clay, which may be done as fast as you raise the Wall; so that when it is finished it will be a *Cistern* of Clay, walled within with brick, and being in a *Cellar* the Brick will keep the Clay moist (although empty of Water) that it will never crack, this I have known to hold Water perfectly well

well in a thaddowy place, though not in a Cellar; Thus in any Gardens or other places may such *Cisterns* be made in the Earth, and covered over, the Rain-water being conveyed thereto by declining Channels running unto it, into which also the Alleys and Walks may be made to cast their Water in hasty showres, also in or neer Houses, may the Water that falls from them be conducted thereunto.

But the usual way to make Pools of Water on Hills and Downs for Cattel, is to lay a good bed of Clay neer a foot thick, and after a long and laborious ramming thereof, then lay another course of Clay about the same thickness, and ramm that also very well, then pave it very well with *Flints* or other *Stones*, which not only preserves the Clay from the tread of Cattel, &c. but from chapping of the Wind or Sun at such times as the Pool is empty; Note also that if there be the least hole or chap in the bottom, it will never hold Water unless you renew the whole labour.

Some have prescribed ways for the making of Artificial Springs, others for the making of Salt-water fresh, but those things being not yet fully experienced we leave, being not willing to trouble our Husbandman with so great Philosophical intricacies, tending rather to lead him from the more plain and Advantagious Method, to imaginary and fruitless attempts.

Great Cold
and Frost.

Heat and Drought do not always attend us, nor do they so frequently afflict us, especially in the greatest part or proportion of this Countrey; but that we have also a share of a superabundant Cold and Moisture, but seeing that they do not so frequently happen together, as heat and drought usually do, we will divide them; The cold that most afflicts the Husbandman, is the bitter Frost that sometimes happen in the Winter or Spring, and are beyond our power, either to foresee or prevent, yet that they may not injure us so far as otherwise they might, we propose these remedies or preventions.

Great Cold
and Frost.

Some Lands are more inclinable and capacitated by their nature or scituation to suffer by bitter Frosts, than others are, as those that lie on a cold Clay or Chalk more, than those that lie on a warm Sand or Gravel; those that lie moist, than those that lie dry, those that lie on the North or East sides of Hills, than those that lie on the South or West; therefore it is good to plant or sow such Trees, Grains or Plants that can least abide the cold in such grounds that are most warmly seated.

And although that it is not an easie thing to alter the nature of the Ground, yet is it feasible to take away the offensive moisture that doth so much cool the Land; whereof more hereafter in this Chapter; and also to place such Artificial defensives against the cold, which may very much remedy this Inconvenience, as we see it is most evident, that the Frosts have a greater influence where the Wind hath its free passage than where it is obstructed, to which end we cannot but propose Enclosures, and planting of Trees as a remedy for this disease; for any manner of shelter preserves the Corn, young Trees, &c. from the injury that otherwise would happen

happen to them, as we see in *Snows* and drowning of Meadows, that the *Snow* and *Water* prove defensive against the cold.

In *Gardens* and other neerer *Plantations*, the Spring-frosts prove most pernicious, the general remedies whereof where the scite and position of the place is not naturally warm, are *Walls*, *Pales*, or other *Edifices*, or tall Hedges or Rows of *Trees*, whereof the *Whitethorn*, but chiefly *Holly* have the preheminance, but these seem remote, and rather preventious against the Wind, the more neerer are the application of new Horse-dung, or Litter that hath lain under Horses, which applyed to the Roots of any tender *Trees* or *Plants*, preserves them from the destructive Frosts, and also by covering whole *Beds* therewith, preserves the *Plants* or *Roots* therein; also *Straw*, *Hawm*, *Fern*, or such like dry *Vegetable*, will defend any thing from the Frosts, although the *Litter* be to be preferred.

But such things that are not to be touched or suppressed, as *Coleflower-plants*, *Gilliflower-slips*, &c. the placing of Sticks like some Booth or such like over them, and covering them with a *Mat* or *Canvas*, or such like, doth very much defend them, giving them *Sun* and *Air* in temperate days, makes them the more hardy, and preserves their colour.

Preserving them also from Rain, unless as much as is sufficient to nourish them, is a good prevention of Frosts; for the Frost injureth no Plant so much as that which stands wet, as I have often observed, that *Cypress-trees* and *Rosemary* standing on very dry ground, have endured the greatest Frosts, when others have perished by the same Frosts, standing in moist ground, although more in the shelter; also the most pernicious Frosts to Fruits succeed Rainy days, a dry Frost rarely hurts Fruit.

Hot Beds are much in use for the propagating of Seeds in the Spring, &c. which when they are covered prove secure remedies.

Conservatories wherein to remove your tender *Plants* in the *Winter*, are a usual prevention of cold, some whereof are made by some degrees warmer than others are, suitable to the several natures of the *Plants* to be preserved.

But the compleatest *Conservatories*, are large leaves of Boards to open and shut at pleasure over your *Orange*, or other *Fruit-trees*, closely pruned against a Wall or Pale, and planted either against your Chimney, where you always keep a good fire, or against some Stove made on purpose, *Aprecocks* so planted against an ordinary Wall with such doors, must needs avail much in the Spring time, to defend the young and tender Fruit from the sharp Frosts, and is a much more practicable and surer way, than the bowing the Branches into Tubs, as some advise; others hang Cloaths or Mats over the *Trees* in Frosty nights: but these are troublesome.

To lay open the Roots of *Trees* in the Spring, to keep them backwards from springing, is a very proper prevention against the Frosts in *Apples*, *Pears*, &c. for we finde a forward Spring that excites the early Fruit too soon, proves very injurious to it in case any Frosts succeed.

The

The freezing of Water also proves some time an injury to the Husbandman; either by hindring his Cattel from drink, or by destroying Fish that are confined in a small pond so frozen; to prevent the latter if you can, let there be some constant fall of Water into it, though never so small, which will always keep a vent open sufficient to preserve the Fish, who can as ill live without Air, as terrestrial Creatures can without Water, any constant motion prevents a total congelation.

Fruit when it is gathered into the House, is subject to be spoiled by Frosts, therefore be careful to lay it in dry Roomes, either seeled, thatched, or boarded; for in frosty Weather the condensed Air which is most in such Rooms, adhering to the Fruit, freezeth and destroyeth it, which is usually prevented covering them with Straw, &c. but best of all by placing a vessel of water near them, which being of a colder nature than the Fruit, attracts the moist Air to its self, to the preservation of the Fruit, even to admiration.

Much Rain.

Great Rains prove injurious to such Lands that are of themselves moist enough; for the remedy whereof, and to prevent such injuries, see more in the next *Section*.

In such Lands that lie at the bottoms or feet of Hills, where the great falls of Rain do annoy the Corn or Grass, care is to be taken for the conveying away of the Water, by Channels or Passages made for that purpose.

In the time of Harvest the greatest Enemy the Husbandman usually finds is Rain, against which the best remedy is Expedition; *To make Hay whilst the Sun shines.*

It is a grand neglect that there are not some kinde of Artificial Shelters made in Lands remote from our dwellings, for the speedy conveyance of Corn into Shelter, in dripping Harvests, and there to remain till fair weather and leisure will admit of a more safe carriage.

Worthy of commendation is the practise used in *Summersetshire*, &c. where they lay their *Wheat Sheaves* in very large Shocks or Heaps in the Fields, and so place them that they will abide any wet for a long time, when on the contrary in *Wiltshire*, and other more *Southerly Counties*, they leave all to the good or bad weather, though far remote from Barns, sometimes to their very great detriment, so naturally slothful and ignorant are some people, and naturally Ingenious and Industrious are other.

Where their Lands lie two or three miles from their Barns, as in some places in *Champion Countreys* they do, the covered *Reek-staval* (much in use westward) must needs prove of great Advantage, in wet or dry Harvests; to save long draughts at so busie a time.

High Winds.

High Winds prove very pernicious and injurious to the Husbandman in several respects, to his *Buildings*, to his *Fruits*, *Trees*, *Hops*, *Corn*, &c. as many in the plain, open, or high Countreys by woful experience do finde; To prevent which as to *Buildings*, common experience and observation we finde, that *Trees* are the onely

onely and most proper Safeguard, for which the *Engb* is the best, although it be long a growing; Next unto that the *Elm*, which soon aspires to a good height, and full proportionable body, and will thrive in most Lands, but any Trees are better than none. As to Fruits, Walls, Pales, or any other Buildings, are a good Prevention and Security for Garden-fruits; but for want of that, Hedges, and Rows of Trees, may be raised at an easie rate, and in little time.

As to *Timber* or other *Trees*, which are also subject to be subverted or broken by High Windes, to abate the largeness of their Heads proves a good Prevention, especially the *Elm*, which ought to have its Boughs often abated, else will it be much more subject to be injured by High Windes than any other Tree.

Hops of any Plant the Husbandman propagateth, receiveth the most Dammage from High Windes, which may in some measure be prevented: Against the Spring Windes which nips the young Buds, and afterwards bloweth them from the Poles, a good Pale, or Thorn-Hedge much advantageth; but against the boisterous Windes when they are at the tops of the Poles, a Tall Row of Trees encompassing the whole *Hop-Garden*, is the best Security in our power to give them: Also be sure to let their Poles be firm and deep in the ground.

As to *Corn*, Windes sometimes prove an Injury to it in the *Ear*, when they are accompanied with great Raines, by lodging of it: but the greatest Injury to it is in the *Grass*, when it is young, (I mean Winter Corn) the fierce bitter Blasts in the Spring destroying whole Fields; The onely and sure Remedy or Prevention against this Disease is Enclosure, as before we noted of Cold.

In *Spain*, &c. where the Mist of Superstition hath dimmed the Spiritual and Natural Sight, the Ringing of Sacred Bells, the use of Holy Water, &c. are made use of to Charm the evil Spirit of the Air, which very frequently in those hotter Climates terrifie the Inhabitants, that he may be a little more favourable unto them than others: But it cannot enter into my thoughts or belief, that any thing we can do here, either by Noises, Charmes, &c. or by the Use of Bayes, Lawrel, &c. can prevail with so great a Natural Power, and so much beyond our Command, Prayers unto God excepted, which are the onely Securities and Defensives against so potent and forcible Enemies.

Blighting and *Mildews* have been generally taken to be the same thing, which hath begotten much error; And the wayes and means used for the Prevention and Cure, have miscarried through the ignorance of the Disease; For

Mildew is quite another thing, and different from *blasting Mildews*, being caused from the Condensation of a fat and moist Exhalation in a hot and dry Summer, from the Blossoms and Vegetables

Thunder and
Tempest, Hail,
&c.

Mildews,

getables of the Earth, and also from the Earth its self, which by the coolness and serenity of the *Air* in the night, or in the upper serene *Region* of the *Air*, is condensed into a fat glutinous matter, and falls to the Earth again, part whereof rests on the Leaves of the *Oak*, and some other Trees whose Leaves are smooth and do not easily admit the moisture into them, as the *Elm* or other rougher Leaves do; which *Mildew* becomes the principal Food for the industrious *Bees*, being of its self sweet, and easily convertible into Honey.

Other part thereof rests on the Ears and Stalks of Wheat bespotting the Stalks with a different (from the natural) colour, and being of a glutinous substance by the heat of the *Sun* doth so binde up the young, tender, and close *Ears* of the *Wheat*, that it prevents the growth and compleating of the imperfect Grain therein, which occasioneth it to be very light in the *Harvest*, and yield a poor and lean Grain in the *Heap*.

But if after this Mildew falls, a showre succeeds, or the *Winde* blow stiffly, it washeth or shaketh it off, and are the onely natural remedies against this sometimes heavy Curse.

Some advise, in the morning after the Mildew is fallen, and before the rising of the *Sun*, that two men go at some convenient distance in the Furrows, holding a Cord stretched streight betwixt them, carrying it so that it may shake off the Dew from the tops of the Corn, before the heat of the *Sunne* hath thickened it.

It is also advised to sow Wheat in open Grounds where the *Winde* may the better shake off this Dew, this being looked upon to be the onely inconvenience Enclosures are subject unto, but it is evident that the Field Lands are not exempt from Mildews.

The sowing of Wheat early hath been esteemed, and doubtless is the best Remedy against *Mildews*, by which means the Wheat will be well filled in the Ear before they fall, and your increase will be much more: As for curiosity sake, Wheat was sown in all moneths of the year, that sown in *July* produced such an increase that is almost incredible: In *France* they usually sow before *Michaelmas*.

Bearded Wheat is not so subject to *Mildews* as the other, the fibres keeping the Dew from the *Ear*.

Hops suffer very much by *Mildews*, which if they fall on them when small, totally destroy them. The Remedies that may be used against it, it is when you perceiue the *Mildews* on them, to shake the Poles in the morning.

Or you may have an Engine to cast Water like unto Rain on them, which will wash the *Mildew* from them: And if you have Water plenty in your Hop-Garden, it will quit the cost, in such years Hops being sold at a very high rate.

Sect. 2.

From the Water and Earth.

Next unto those *Ayerial* or *Cælestial* Injuries which descend upon us, we shall discourse of such that proceed from the *Water* and *Earth*, that do also in a very great measure at sometimes, and in some places afflict us, proving great Impediments to those Improvements that might otherwise be easily accomplished; and also great Detriments unto the Countrey man, upon that which he hath already performed.

As the want of Water in some places proves a great Impediment and Injury to the Improvement and management of *Rustick* Affairs, so doth the superabundant quantity; Either from the flowings of the Sea over the low Marsh Lands, at Spring-Tides and High-waters, or from great Land-floods, but principally from the low and level scituation of the Land, where it is subject to Springs overflowings, &c. *Much water offending.*

It is evident that much good Land hath for many ages yielded little benefit by reason of the High Waters that sometimes have covered it over, and destroyed that which in the intervals hath grown; And hath also over-flown much good Land so frequently, that it hath become useles; but by the extraordinary Charge, Labour, Art, and Industry of some publique spirited persons, very great quantities thereof hath been gained from the power of that Grand Enemy to Husbandry, as may be observed in those vast Levels of rich Land in *Lincoln-shire*, and *Tork-shire*, *Cambridge-shire*, &c. in our Age recovered. Many other vast Flats and Levels there are on the Borders of this Kingdom, that are beyond the power, strength, or interest of a private Purse to attempt, yet to the Publique at a publique Charge would redound to an infinite Advantage, and not onely maintain Thousands at Work, (Employment being the greatest Check to Factious Spirits) but bring in an Yearly Encrease of Wealth, one of the Principal Supports of this Kingdom against its Enemies, and that without the hazards of an *Indian Voyage*. *Overflowing of the Sea.*

Land-floods in some places, especially on the great Flats and Levels, prove a great Annoyance to the *Husbandman*, that it is of equal Concerment to divert the Land-floods from some Lands, as to drain the Water that resides upon it, and otherwise annoys it. *Land-floods.*

As we see in the Draining the Great Level between *Tork-shire* and *Lincoln-shire*, by the *Isle of Axholm*, where the great River *Idle* navigable of its self, that formerly passed with its great Land-floods through the vast Level on the *Tork-shire* side of *Axholm*, by the Art and Industry of the Drainers, through a new Cut is carried into *Trent* on the other side of the Isle, that the Draining of that Great Level, which otherwise might seem impossible to be done,

by that very means became most feasible; so that here we need say no more, but that as the conveniency of the place will permit, you divert the Land-floods and Streams before you attempt a through Draining, if it be feasible and requisite, lest you multiply your Cost, and be at last frustrate of your purpose.

Standing Waters.

The greatest of our In-land Annoyances to Husbandry, occasioned by water, is from the standing or residing of water on our flat and level Marishes, Meadows, or other Lands, whether occasioned from Rains, Springs, or otherwise.

Where there is any descent or declining of Land, by cutting Drains to the lowest part, it is most easily performed.

But where it is absolutely flat and level, it is much more difficult, yet are there few such Levels, but there are Places or Currents for the Water to pass out of them, which you must sink deep and wide enough to drain the whole, and then make several Drains from each part of the Marsh or Level, beginning large and wide at the mouth of the Drain, and lessening by degrees, as it extends to the extremities of the Land you drain; be sure to make the Drains deep enough to draw the Water from under the Marsh or Bogg, and make enough of them that may lay it thoroughly dry.

If you cannot make a passage deep enough to take the water away from the bottom of your Drain, which in many places is a great impediment of this Improvement, either by reason that you cannot cut through another's Land, or that the passage be long, or that some River is near, which will be apt to revert upon you, or such like, then may an Engine commanded by the wind be of great use, and effect that which by any other way could not be done; the description whereof see before in the third Chapter. According to the height you raise the water, may you proportion the greatness or smallness of your Engine, you need not fear winds sufficient at one time or other to keep your Drains empty; for during the greatest Calms are usually the greatest Doughts, and in the wettest Seasons winds are seldom wanting, especially on Flats and Levels.

Over-much moisture proves also very injurious to Corn, and other Plantations, the usual Remedy whereof is to lay the Land high in Ridges, and cut Drains at the ends of the Furrows, to carry away the superfluous water.

In Orchards and Gardens it usually hinders the growth and prosperity of Trees and other Plants, against which the best Remedy is to double the Land, that is by abating the one half thereof about a foot more or less, according to the nature and goodness of the Soyl, in long Walks or Rows about seven or ten foot broad, as to you seems best and most convenient, and cast it on the other in banks or borders, so that you will then have those banks to dry to the bottom of your Walks, and all of the best of the mould on which you may plant your Trees, &c. where they will thrive as well as on any other dryer Land, being planted shallow.

Take

Take this as a general Observation in *Agriculture*, that most of the barren and unimproved Lands in *England* are so, either because of Drought, or the want of Water or Moisture, or that they are poisoned or glutted with too much, therefore let every Husbandman make the best use of that Water that runs through his Lands, and by preserving what falls upon his Lands, as we have at large before directed in this Treatise, and drain or convey away that which superabounds and offends, then would there be a far greater plenty of all manner of Tillage and Cattel, to the great enriching of this Kingdom.

Water is also very offensive in our Dwelling-houses, that we cannot make Cellars for Beer, &c. which may be several ways cured or prevented.

Either by laying the bottom and sides of the Cellar with Sheet-Lead, and a Floor of boards thereon, to preserve it from Injury; several such Cellars there are in some Cities and Townes that lye low in the Water; but this is too costly a way for our Husbandman.

Another way is to joynt your Bricks or Stone with *Tarris*, or the *Cement* before described in this Chapter for the keeping in of water in *Cisterns*.

Also you may Bed your Cellar with Clay, and then Brick or Stone it over, after the same manner as we directed before in this Chapter, for the keeping of water, &c.

Or you may sink a Well or Pit near your Cellar, and somewhat lower than it, into which you place a Pump, that at such times as Water annoys you, it may by that means be removed.

Much Land there is in *England* that is capable of a very great Improvement, by removing those common and stubborn Obstacles, as *Stones, Shrubs, Goss, Broom, &c.* which are naturally produced in many places, and the faint-hearted, lazy, & sometimes beggarly Husbandman, had rather let them grow and suck out the Marrow and Fat of his Land, than bestow any cost or pains to remove them, and is contented with now and then a bundle of Bushes, &c. when the removal of them would not onely be an Improvement of his Land by their absence, but the materials themselves by a right and judicious way of ordering them, might become also an additional Improvement.

As first of *Stones*, which being picked up and laid on heaps about the Roots, of either Fruit or Timber-trees, planted on the bounds, and in rows on the Land, is a very great help and Advantage to the growth of such Trees, and saves the labour of carrying them off the ground, which charge usually exceeds the charge of picking them up, this onely where *Stones* offend or are injurious.

Shrubs, Goss, Broom, &c. prove a very great anoyance to Husbandry, and the difficulty, and charge in plucking them up, is the principal impediment to their removal, to such that are ignorant of the most dextrous ways used to that purpose, the best whereof I finde to be this, described by Mr. Platt, viz. a very strong Instru-
ment

ment of Iron like unto a Dung-fork with three grains or tines, only much bigger, according to the bigness of the Shrubs you use it about; The upper part thereof is a very strong and long *Stail*, or Handle, like a Leaver; now set this Instrument at a convenient distance from the Root slope-wise, and with a Hedging-beetle drive it in a good depth, then lift up the *Stail*, and place under it across an Iron-bar, or such like Fulciment, to keep it streight and that it sink not into the ground.

Then take hold of the cord that before ought to have been fastened to the top of the *Stail*, and by this meanes may you eradicate any *Shrubs*, &c. if it will not do at once, place it on the other side, &c.

These *Bushes*, *Brakes*, and such like, though they are of little worth or use for any other thing, yet are they very necessary and beneficial to improve the Land by burning them, being dry either by themselves or under heaps of Turf, Earth, &c. as before we observed.

chap. 5.

Weeds.

Some Lands are more prone and subject to Weeds, and that in some years than other, which is sometimes occasioned by water standing on it, destroying the Corn and such Seeds that are usually sown in it, and nourishing such Weeds that most delight in moisture; the onely remedy whereof is to lay it dry, and add some convenient drying and lightning materials or composts thereon, as *Sand*, *Ashes*, &c.

Also some sorts of Dungs or Manures cause Weeds, as dung made of *Straw*, *Hawm*, *Fern*, or such like, laid on Lands in any great quantity without any other mixture of *Horse-dung*, *Sheeps-dung*, *Lime*, *Ashes*, or such like hot *Compost*, which doth in some measure correct the cold and sluggish quality of it, but in some years and on some Lands, any ordinary cold dung begets Weeds, which injure the Corn more, than the fatness of the dung Advantages, therefore *Lime*, *Marle*, *Chalk*, *Ashes*, &c. are to be preferred in moist Lands.

chap. 5.

Weeds in Pasture-lands, are best destroyed by burning of it in Turfs (as before we discovered) or by plowing of it without burning.

Rushes, Flags, &c.

Rushes, *Flags*, and such like Aquaticks, are best destroyed by draining, so that you cut your Drains below the Roots thereof, that it may take away the matter that feeds them.

Sowthistle.

The Sowthistle proves a great annoyance to some Lands by killing the Grass, Corn, &c. although it be a sure token of the strength of the Land; the way to destroy them is to cut them up by the Roots before feeding time, the Advantage you will receive, will answer your expence and more.

Fearn.

The way to destroy this so common and known an Annoyance, is to mow it off in the Spring, whether with an Iron or Wooden Syth it matters not; for it will easily break, which work reiterate the same year as fast as it grows, and it is confidently affirmed that it will kill and destroy the Fearn for ever after.

Improvement and bettering the Land by *Soyling*, *Marling*, or *Liming*,

Liming, &c. is also a principal remedy against all manner of *Broom*, *Furze*, *Heath*, and other such like trumpery, that delights onely in barren Lands.

Very much differing from *Mildews* is the blighting of Corn, the *Mildews* proceeding from a different cause and happening onely in dry Summers, when on the contrary Blighting happens in wet, and is also occasioned through the too much fatness and rankness in Land, as is observed in strong Lands, they usually sow it with *Barley*, *Pease*, or such like, to abate the fertility thereof, before they sow their Wheat, which would otherwise be subject to Blights, or Blasting. Blights and Smut.

Also Wheat sown on level or low Land, in moist years is subject to the same Inconveniencies; for you may observe that the Wheat that grows on the tops of the Ridges in moist years to be better and freer than what grows in the furrows, which is usually Blighted by means of Water and fatness lying more about it than the other; for Wheat naturally affects to be kept dry on moist and strong Ground; Therefore as moisture and the richness of the ground together occasions this Disease, by knowing thereof you may easily remedy it, by laying your Land on high Ridges, which if it be never so rich, the Wheat growing thereon will hardly be Blighted, if not overcome with moisture.

Smut seems to proceed from the same cause, therefore need we Smut. to say the less.

Onely that sometimes smuttiness proceeds from other causes, as by sowing of *Smuttery-corn*, by soyling the Land with rotten Vegetables, as *Straw*, *Hawm*, *Fearn*, &c.

It is confidently affirmed, that the Smuttery grains of Wheat being sown, will grow and produce ears of Smut: but I confess I have not yet tryed, and shall therefore suspend the belief thereof till I have.

The sowing of Wheat that is mixed with Smut, doth generally produce a Smuttery Crop (whether the Smut it self grow or not) unless it be first prepared, by liming of it, which is thus done, first shake your *Lime*, and then moisten your Corn and stir them well together, &c. and sow it.

Or by steeping of it in *Brine*, either of which are good preventions against the Smut.

You may also prepare the Ground by *liming*, or other ways of enriching it, with sharp or saline Dungs or Soyls, and it will produce Corn free from Smut, for it is most evident that Land often sown with the same grain, or much out of heart, produces a smuttery Crop, as may be easily perceived where the same Seed hath been sown on two sorts of Land of different goodness, the one Crop hath been Smuttery, the other Free, so that smuttiness seems to be a kinde of Sicknes incident to Corn, which may by the aforesaid means be cured, which if the Smuts themselves would really grow and produce Smut again, all remedies proposed and attempts were needless.

Sect. 3.

From several Beasts.

Against the trespasses of domestick Cattel, breaking out of your Neighbours grounds into yours, its needless to say any thing, every one knowing that a good and secure Fence is the best prevention, and a Pound the best remedy or cure if the other will not serve; But other Beasts there are that no ordinary Fences will keep out, and will hardly be brought to the Pound.

Foxes.

As *Foxes* which usually torment the laborious Husbandman, by taking away and destroying his *Lambs*, *Poultry*, *Geese*, &c. that in some places neer great Forrests and Woods, they can hardly keep any thing, but under lock and key, against which Gins are usually made use of, which being baited and a train made by dragging raw flesh across his usual paths or haunts, unto the Ginn, it proves an inducement, and a snare to excite him to the place of his destruction.

It is also a very commendable and noble exercise in our Nobility and Gentry, to hunt these destructive Beasts, and did they prosecute it at their breeding times and at other times also, with an intent to destroy the whole breed or kinde, there would soon be an end of them.

Coneys, Hares, &c.

In several places the Husbandman suffers much by *Coneys* and *Hares*, that feed down his *Corn*, &c. when it is young, especially in hard Winters, and in many places they have not liberty to secure their own from them: but where they have, I suppose the Countrymen understand so well the several ways to take them, being more encouraged by the meat, than the damage they save, that its needless here to instruct them.

Polcats, Weasels and Stoats.

It is not a little injury these Animals do to *Warrens*, *Dove-houses*, *Hen-roosts*, &c. but the ways by taking them in *Hutches*, and in small Iron-gins like Fox-gins, are so well known, that I need say nothing of it.

Onely that to prevent *Polcats* or such like from destroying your *Pigeon-house*, be sure if you can to erect it, where you may have a Ditch or Channel of Water to run round it, and it will keep those vermin from making their Burroughs under the ground.

Moles, or Woules.

Moles are a most pernicious enemy to Husbandry, by loosening the Earth, and destroying the Roots of *Corn*, *Grass*, *Herbs*, *Flowers*, &c. and also by casting up hills to the great hinderance of *Corn*, *Pastures*, &c.

The common and usual way of destroying them is by traps that fall on them, and strike the sharp tines or teeth through them, and is so common that it needs no description.

But the best and compleatest sort of Instrument to destroy them, that I have yet seen, is made thus, Take a small board of about three inches and a half broad, and five inches long on the one side thereof, raise two small round Hoops or Arches, at each end one, like unto the two end Hoops of a Carriers waggon, or a Tilt-boat, capa-

capacious enough that a Mole may easily pass through them, in the middle of the board make a hole about the bigness that a Goose quill may pass through, so is that part finished, then have in readiness a short stick about two inches and a half long, about the bigness that the end thereof may just enter the hole in the middle of the board; Also you must cut a Hasel or other stick about a yard, or yard and half long, that being stuck into the ground may spring up like unto the springs they usually set for Fowl, &c. then make a link of Horse-hair very strong that will easily slip, and fasten it to the end of your stick that springs, also have in readiness four small hooked sticks, then go to the Furrow or Passage of the Mole, and after you have opened it, fit in the little board with the bended hoops downwards, that the Mole when she passes that way, may go directly through the two semi-circular hoops, before you fix the board down put the hair spring through the hole, in the middle of the board, and place it round, that it may respond to the two end hoops, and with the small stick (gently put into the hole to stop the knot of the haire spring) place it in the Earth in the passage, and by thrusting in the four hooked sticks, fasten it, and cover it with Earth, and then when the Mole passeth that way, either the one way or the other by displacing or removing the small stick that hangs perpendicularly downwards, the knot passeth through the hole and the spring takes the Mole about the neck; though this description seem tedious, yet the thing is very plain, and easily performed, and much cheaper, surer, and feasible, than the ordinary way.

Others destroy them very expeditiously by a *Spaddle*, waiting in the mornings when they usually stir, and immediately cast them up, especially about *March* when they breed, by turning up the Hills where under they lay their young, they usually making their nests in the greater Hills, and are most easily discerned, then also will the old ones come to seek their young, which you may presently take.

The *Pot-trap* is by some much commended, which is a deep Earthen-vessel set in the ground to the brim, in a bank or Hedgerow, which wisely set and planted at all times, but especially in the natural season of bucking time about *March*, will destroy them insensibly.

Every Country man almost is sensible of the great Injuries, and Annoyances they receive from these *Vermine*, both in the Fields where they raise *Nurseries* of Trees, in their *Gardens* where they sow and plant *Beans*, *Pease*, &c. and in their *Houses*, *Barns*, and *Corn-reeks*. *Mice or Rats.*

In the *Fields*, *Orchards*, *Gardens*, &c. I know no readier way to destroy them, than by placing an Earthen-pot in the ground, and covering it with a board, with a hole in the middle thereof, and over the board to lay *Hamm* or such like rubbish, under which the *Mice* seek for shelter, and soon finde their trap to receive them.

The usual way of building *Reeks* of *Corn* on *Stavals* set on stones, is the onely prevention against *Mice*, and has proved so successful,

that in some places large Edifices are built on such stones that they supply the defect of Barns, being also covered like them.

Granaries also I have seen built after the same manner, Binnes or Hutches for Corn may be placed on pins like the other, and prove secure places for Corn, against these pernicious Vermine, but great caution must be used, that no stick, ladder, or other thing lean against these places, lest the *Mice* finde the way to come where you would not have them.

In your *Flower-gardens*, *Apiary*, or in the several rooms of your House, traps may be placed to destroy them, unless where you can conveniently keep a Cat the onely enemy and destroyer of *Mice* and *Rats*.

Arsenick, or the Root of *White-bellebor* will destroy them, being given with sugar or such like mixture, the last is the best because it destroyes onely *Rats* and *Mice*.

Sect. 4.

From Fowls.

As the best of contents this world affords, hath its part or share of trouble and vexation, so this pleasant and excellent *Rustick Life* and *Employment*, is not free from care and trouble how to preserve it self from those Enemies and Plagues that daily attend it, sometimes the *Heavens* frown, the *Water* swell, the *Bryers* snarl, the *Wild beasts* are envious at our innocent and most delectable enjoyments, and if these withdraw their evil influence, yet have we the *Fowls* of the *Ayr*, *Insects*, and several other *Evils* to encounter withal, which without our diligent Care and Industry, are ready to bereave us of the best part of the Fruits of our labours.

*Kites, Hawks,
&c.*

As we frequently observe that *Kites*, *Hawks*, and other Birds of Prey, wait for *Pigeons*, *Chickens*, tame *Pheasants*, &c. therefore is it very necessary that the *Countreyman* keeps a Fowling-piece ready fitted and charged, which is the best means to destroy and scare them away.

Also you may place small Iron-gins, about the breadth of ones hand, made like a Fox-ginn, and baited with raw Flesh, whereby I have caught very large Hawks.

Also by the streyning of Lines or peices of Nets over the places where you keep tame *Pheasants*, *Chickens*, or such like, will fray them away.

The cutting down of Trees about your Pigeon-house will keep them from haunting it so much as otherwise they would do.

*Crows and
Ravens, &c.*

Crows, *Ravens*, *Rooks*, and *Magpies*, are great Annoyances to Corn, both at Seed-time, pulling it up by the Roots whilest it is young, and feeding on it also at the Harvest; a good Fowling-piece is the best Instrument for the present; But the onely way to destroy the kinde of them, and make their Flocks a little thinner, were by some publique Law to encourage the destruction of their nests and young, which are so obvious at the building time that it seems to be a very feazible work, and much to be preserved before *Crow-nests*, &c.

Several

Several pretty Inventions of Scare-crows there are to keep the Corn free from them, amongst which this is esteemed the most effectual, *viz.* To dig a hole in some obvious place where the Crows, &c. annoy your Corn, let it be about a foot deep or more, and near two foot over, and stick long black Feathers of a *Crow* or other *Fowl*, round the edges thereof, and some also in the bottom, several of these holes may be made if your ground be large; And where these holes are thus dressed, the Crows will not dare to feed. I presume the reason is, because whilest they are feeding on the ground the terrifying Object is out of their sight, which is not usual in other Scare crows, wherewith in a little time they grow familiar, by being always in view.

Dead Crows, &c. hang'd up do much terrifie them, but amongst Pigeons. Cherry-trees, and other Fruits which are much prejudiced by the Crows, &c. draw a Pack-thred or small Line from Tree to Tree, and fasten here and there a black Feather, and it is sufficient.

These Fowl that bring so great an Advantage to one, prove a far greater Annoyance and Devourer of Grain to all the rest of the Neighborhood: It is an unknown quantity of *Wheat*, *Barley*, *Pease*, &c. that these devour; Not to mention the prodigious Computation that some have made of the Damage committed by them on the *Corn*, *Grain*, &c. yet is most evident that they destroy a great part of the *Seed*, and *Crop*, notwithstanding several stand for their Vindication, alleading that they never scrape, and thereof take onely the Grain that lyes on the surface of the Earth, that would otherwise be destroyed, and not grow. To which I answer, That that very Corn that lyes on the Surface may prove the best Corn, unless (in Winter Corn) the extreame Frosts destroy it, or (in the Spring) the extreame Drought. It having been of late found to be a piece of very good Husbandry in some light and shallow Lands, first to plough it about *August*, and then to run the Fold over it, and well settle it, and afterwards to sow and harrow it, which must needs make well for the *Pigeons*, and ill for the Husbandman, where they cannot be kept from it.

Also it is to be observed, That where the Flight of *Pigeons* fall, there they fill themselves and away, and return again where they first rose, and so proceed over a whole Piece of ground, if they like it; Although you cannot observe any Grain above the ground, they know how to finde it: As I have seen the Experience of it, that a Piece of about two or three Acres being sown with *Pease*, the *Pigeons* lay so much upon it, that they devoured at least three parts in four of it, which I am sure could not be all above the surface of the Ground, that their smelling is their principal Director. I have also observed, having sown a small Plat of *Pease* in my Garden (near a *Pigeon-house*) and very well covered them that not a *Pease* appeared above ground, in a few days a parcel of *Pigeons* were hard at work in discovering this hidden Treasure, and in a few days of about two quarts, I had not above two or three *Pease* left; for what they could not finde before, they found when the Buds appeared, notwithstanding they were howed in,

and well covered; their smelling onely directed them as I supposed, because they followed the ranges exactly.

The Injury they do at Harvest on the *Pease*, *Fetches*, &c. I hope none can excuse; therefore may we esteem these amongst the greatest Enemies the poor Husbandman meets withal, and the greater because he may not erect a *Pigeon-house* also to have a share of his own spoils; none but the rich being permitted so great a Privilege, and also so severe a law being made to protect these winged thieves, that a man cannot *sum defensendo* encounter with them.

You have therefore no remedy against them, but to affright them away by noises, or such like; Also you may shoot at them, so that you kill them not, or you may (if you can) take them in a Net, cut off their tails and let them go, by which means you will impound them, for when they are in their houses, they cannot bolt or fly out of the tops of their houses, but by the strength of their tails; which when they are weakened, they remain prisoners at home.

Jays.

The Jay proves a great devourer of *Beans*, *Cherries*, and other garden Fruits, and is also a subtle Bird, but is easily met withal, if you are watchful in a morning early, and have a good ambush, which you must change sometimes lest they discover you, they make but short flights, as it were from *Tree to Tree*, that you may easily pursue them.

A very good way to take them, is to drive a stake into the ground, about four foot high above the surface of the Earth, let the stake be made picked at the top, that a Jay may not settle on it, then within a foot or thereabouts of the top, let there be a hole bored through, about three quarters of an inch diameter, fit a pin or stick to the hole, about six or eight inches long, then make a loop or spring of Horse-hair fastened to a stick or wand of *Hassel*, that may be entered into the stake at a hole neer the ground, and by the bending of the stick put the loop of Horse-hair through the upper hole, and put the short stick a little way into the hole, and lay the loop round on the short stick, that the Jay when he comes, finding this resting place to stand conveniently amongst his food, perches on the short stick, which immediately by his weight falls, and gives the spring the Advantage of holding the Jay by the leggs, this is an undoubted way of taking them, if they are placed amongst the *Beans* or such like where the Jays haunt, it being their usual custom to hop from *Tree to Tree*, or any thing they can meet withal.

Small finches.

These are most pernicious Birds to young Fruit-trees, by feeding on the young pregnant Buds in the Springtime, which contain the Blossoms, and are the onely hope of the succeeding year.

They are easily taken off with a small Fowling-piece, onely you must be cautious that your shot spoyle not the young Cions or Branches of your Trees.

They may also be scared away with threads tied from *Tree to Tree*, and Feathers fastened on them.

These

These although they are but small, yet are they a numerous generation of Corn-eaters, it is unknown how much they devour in this Kingdom, and what a great damage it proves to the *husbandman*, especially in scarce and dear years. Sparrows.

Many ways are made use of to destroy them, but none more effectual, than the large *folding Sparrow-net*, which will take many dozen at a draught, they being so easily induced to come to a *Shrape* or Place baited for them, especially in the hard weather in the Winter, and in the Summer, before the Corn is ready for them, at both which times meat is scarce abroad, and then they flock to Barns.

Sect. 5.

Of Insects, and Creeping things offending.

Moist and warm Lands, which are usually the most fertile, are most subject to these Vermin, *Frogs* are best destroyed, and prevented in *February*, in the ditches where they spawn, by destroying both *Frogs* and *Spawn*; *Toads* are easily discovered in the Summer evenings (by a candle) creeping up and down the Walks and Passages about your *House, Garden, &c.* Frogs and Toads.

To *Wall-fruit*, and several sorts of *Garden-plants*, there cannot be a more pernicious enemy than *Snayls*, which you may in a dewy morning easily finde where they most delight to feed, but the surest way is in the hard Winter, to seek out their haunts, and make a clean riddance of them, they lie much in the holes of *Wals*, behind old *Trees*, under thorn or other old and close *Hedges*, in one year I caused neer two bushels to be gathered in a Winter, in a *Noble mans Garden*, which had in precedent years destroyed the most of their *Wall-fruit*, and ever after they had great plenty. Snayls and Worms.

Ever observe not to pluck off such Fruit the *Snayls* have begun to feed on, but let it remain; for they will make an end of that before they begin on more.

Worms may be picked up clean by a candle in a moist evening, if any escape you, another evening may serve to finde them.

Your Beds watred with any strong *Lixirum*, made of the *Ashes* or fixed *Salts* of any *Vegetable*, will not onely destroy *Worms*, but prove an extraordinary improvement, and enriching of the ground.

Lay *Ashes* or *Lime* about any Plant you desire to preserve from *Snayls* or *Worms*, and they will not come neer it, because the hot and biting nature thereof, hurt their naked and tender bodies, therefore as the Rain or other Moisture weakens, the *Ashes* or *Lime* renew it, lest it prove useles.

Rarely do these offend in the *Fields, Orchards, or Gardens*, yet are they very troublesome *guests* in the *House*, where it stands neer any *Fens, Waters*, or such like places, tending much to the generation of *Insects*. Gnat and Fly.

To keep the *Windows* of your *Chambers* close in the Summer time, especially towards the evening, is a good prevention.

To

To burn straw and such like up and down in the Chamber, in the evening before you go to bed will destroy them; for either they will fly to the flame, and be consumed, or else the smoak will choak them.

Aspen-leaves hanged up in the Room, will attract them unto it, that you will be the less troubled with them.

The balls of Horse-dung laid in the Room, will do the same, if they are new.

wasps and
Hornets.

These usually prove very injurious to some sorts of *Fruits*, to *Bees*, &c. and are several ways destroyed, first

By way of prevention, that is in the *Spring* or *Summer* before they have encreased, to destroy the old ones; for from a few do they encrease to a multitude.

Or you may smoak or stifle them, if they are in any hollow Tree, or scald them if in thatch of an House or Barn, &c. or in the ground you may either scald, or burn them, or stamp in the Earth on them, and bury them.

To destroy such as come to your *Fruit*, *Bees*, &c. set by them *Sider*, *Verjnice*, *sowr Drink*, or *Grounds*, in a short necked *Vial* open, wherein you may catch many.

Also you may lay for them, *sweet Apples*, *Pears*, *beasts Liver*, or other *Flesh*, or any thing that they love, in several places, upon which you shall have sometimes, as many as will cover the bait, which you may kill at once.

Caterpillars.

We term those *Caterpillars*, that destroy the leaves of our *Trees* in the *Summer*, devour *Cabbages* and other *Garden-tillage*, and are generally the effects of great droughts.

To prevent their numerous encrease on *Trees*, gather them off in the *Winter*, taking away the *Puckets*, which cleave about the *Branches*, and burning them.

In the *Summer* whilest they are yet young, when either through the coldness of the *nights* or some *humidity*, they are assembled together on heaps, you may take them and destroy them.

Kerwigs.

These in some years prove injurious to *Fruits*, by the greatness of their numbers feeding on and devouring them.

And are destroyed by placing *Hoofs* or *Hornes* of *Beasts* amongst your *Trees*, and *Wall-fruit*, into which they will resort, early in the morning you must take them gently, but speedily off, and shake them into a vessel of scalding water.

Lice.

By reason of great drought, many sorts of *Trees* and *Plants* are subject to *Lice*, and seeing that they are caused by heat and drought, as is evident in the *sweet-bryar* and *Gooseberry*, that are onely *lowsy* in dry times or in very hot and dry places, therefore frequent washing them, by dashing water on them, may prove the best remedy.

Ants.

Ants or *Pismires* are injurious to a *Garden*, and also to pasture *Lands*, as well by feeding on *Fruits*, as by casting up *Hills*, &c.

To keep them from your *Trees*, incompass the Stem four fingers breadth, with a circle or rowl of *Wool* newly plucked from a *Sheeps belly*.

Or

Or annoynt the Stem with Tar.

Also you may make boxes of *Cards* or *Pastboard* pierced full of holes with a bodkin, into which boxes put the powder of *Arsenick* mingled with a little *Honey*, hang these boxes on the Tree, and they will certainly destroy them, make not the holes so large that a Bee may not enter lest it destroy them.

Also you may hang a glass-bottle in the Tree with a little *Honey* in it, or moistned with any sweet *Liquor*, and it will attract the *Ants*, which you may stop, and wash out with hot water, then prepare it as before.

Waring often of *Allier* or green *Walks* will drive away or destroy the *Ants* that annoy them.

Ant-hills prove a very great injury to Meadows and Pasture Lands, not onely by the wasting of so much Land as they cover, but by hindring the Syth, and yielding a poor hungry food, and pernicious to Cattel. To destroy Ant-hills.

And may be thus easily destroyed, pare the Turf off, beginning at the top, and cutting it down into four or five parts, and lay it open, then cut out the core below the surface so deep, that when you lay down the Turfs in their places, as they were taken up the place may be lower than the other ground, to the end that water may stand in it, to prevent the *Ant* from returning, which otherwise she will assuredly do, then spread the Earth you take out thinly abroad; Also the proper season for this is in the Winter, and if the places be left open for a certain time, the Rain and Frost upon it, will help to destroy the remaining *Ants*, but be sure to cover them up time enough, that the Rains may settle the Turfs before the Spring.

The greatest Injury these *Vermine* do us, is in biting Children, Cattel, &c. Snakes and Adders.

They affect *Milk* above any thing, and as old Authors say, abominate the *Asb*, there may you use the one by placing of it hot in any place where they frequent to attract them, where you may destroy them, and the other by laying *Aspen-sticks* in places where you would not have them come.

But the most proper remedy against these *Vermine*, is to keep *Peacocks*, which prey upon them.

Their sting or bite is most easily cured, if you timely apply a hot *Iron* to it, holding it so neer as you are able to abide it, and it is by some *Ingenious* persons confidently affirmed, to attract the Venom totally from the wound. To cure the stinging of Adders, or biting of Snakes.

Travellers relate that in the *Canaries*, the Natives cure the biting of a very venomous Creature (that lurks amongst the Grapes, and usually bites them by the fingers) by a streight ligature below the wound, and holding the finger bitten upright, for some time, out of which the *venom* ascends, it being of a fiery nature, naturally tending upwards, and may therefore be attracted by fire its like.

Sect. 6.

Of some certain Diseases in Animals, and Vegetables.

Of Beasts and Fowl.

There are several epidemical and destructive Diseases to Cattel, Fowl, &c. which sweep away a great part of the Husbandmans stock before it cealeth, or he know how to prevent it, which is esteemed a great deficiency, that those ways that some have discovered, and found effectual to prevent, and also to cure such Diseases, are not made publique, the general stock of the Kingdom may as well be preserved, as some few Cattel, in such general Distempers; It being not our intent in this Book to say any thing of Corporal Diseases of Beasts or Fowl, because that subject is so completely handled by several others, and is not absolutely necessary for our Husbandman to know, there being almost in every place professors and practisers of that Art, and that have Materials and Instruments for that purpose, yet for that I meet with some general and easily practicable Instructions, perhaps not familiar with Countrey Farriers, or Horse Doctors, I shall a little digress.

Of the Murrain.

This Disease is principally caused from a hot and dry season of the year, or rather from some general putrefaction of the Air, and begetteth an inflammation of the blood, and causeth a swelling in the throat, which in little time suffocateth the Cattel; Also the letting dead Cattel lie unburied, which putrifying may cause a general infection to that sort of Cattel, as the learned Van-Helmont observes that these infectious Distempers go no farther than their own kind.

Therefore to prevent this Disease, let them stand cool in Summer, and to have abundance of good Water, and speedily to bury all Carrion.

And if any of your Cattel be already infected, speedily let them blood, and give them a good Drench, &c. by which means divers have preserved their Cattel, when their Neighbours have perished.

Of the rot in Sheep.

In moist years Sheep are subject to the rot, in the same grounds, where in dryer years they are not, and that not onely from the moisture; for then would Sheep rot in all moist grounds, in dry years as well as in wet, but from a certain putrefaction, both in the Air and in the Grass or Herbs, that usually attends them in such moist years, which together with their moist food doth corrupt their Livers, and bring this Disease.

The cure whereof is difficult, unless it be done betime before the Liver be too much wasted, the removal of them to the salt Marshes, where they may be had, is a good remedy.

If May and June prove wet moneths it causes a firm and frosty Grass, which together with the bad Air that must necessarily follow, causes the rot in Sheep, therefore in such Summers keep your Sheep on the dry and barren Lands, and fodder them in Winter with the hardest Hay or most astringent Fodder.

Some grounds yield a soft Grass more than other, subject to breed

breed the rot in Sheep, therefore feed other Cattel there, and your Sheep in the driest, hardest, and healthiest Pastures.

If your Sheep be infected with the rot, which you may discern by the colour of their Eyes; Some prescribe to pen them up in a Barn or large Sheep-coat set about with wooden Troughs, and therein feed them with Oats a day or two, then put amongst them some Bay-salt well stamped, and after that a greater quantity, till such time as they begin to distaste it, then give them clean Oats another day or two, and afterward serve them with Salt as before, this course being followed untill their Eyes have recovered their natural colour, they will then be perfectly cured, where you have not a house convenient, it may be done open, the saving of their dung (as before we directed) will answer the greatest part of ^{Chap. 5.} your expences.

Folding of Sheep in May or June, if they prove wet, makes them rot the sooner, because they more greedily devour the hurtful Grasse in the morning than those not folded, therefore liberty from the Fold at that time is a good prevention.

An approved Experiment for the Cure of the Fashions in Horses, and the Rot in Sheep.

Steep the *Regulus* of *Antimony* in Ale with a little of the *Spice* called *Grains* and a little Sugar, which give to a horse about half a pint at a time, two or three times, with a day or two's intermission between each time, to a Sheep about two or three ounces after the same manner; The same or the following Receipt may be also given to Swine for the *Measles*, &c. and to make them fat.

Give him halfe a dram of crude *Antimony* in his meat, it will ^{For Swine.} make him have a good stomach, and it will likewise cure him of all foulness of his Liver, and of the *Measles*; The same is also sovereign for any other Beasts.

Trees and *Plants*, and other Inanimate things, are subject unto ^{of Trees and Plants.} Diseases that deprive them of, and abate their excellency, worth and duration, as well as living Creatures, and it doth as well require the care and industry, and skill of the Husbandman to inspect into their Nature, and make use of such means as are requisite as well to prevent, as cure such Diseases.

The *Canker*, *Moss*, *Bark-bound*, and *Worms* in Trees, prove very pernicious, their cures we have already discoursed of.

The *Jannadies* or *Langor* of Trees, makes them seem to repine, and their Leaves to fall off or wither, and proceeds from some hurt done to their Roots, either by *Moles* or *Mice*, or by the stroak of some Spade, or by the Tree standing too moist or low, according as you finde the Disease, so must you make use of a remedy, either by searching the Root, and if you finde any wound or gall, to cut it off a little above such wound, and lay some Soot there to keep *Vermine* off, if the injury came from them, or if *Water* offends, either divert the *Water* or remove the Tree, if it be planted too deep, it is better to raise it than let it stand where you may be confident it will never thrive.

The general Diseases of Trees, and impediments to their thriving,
H h are

are either they stand too deep, too dry, too cold, too moist, too much in the wind, &c. according to the divers nature and disposition of the Tree.

Therefore if you expect that a Tree should thrive, observe his Nature, and in what place it most delights, which the six and seven Chapters of this Book treating of Woods and Fruit-trees, will sufficiently direct.

Sect. 7.

Of Thieves and ill Neighbours.

There is no more constant, certain, and pernicious enemy to the Husbandmans thrift, then Man himself, *homo homini Demon*, they rob and steal from, oppress, malign, injure, persecute, and devour one another, to the decay of Arts and Sciences, and even to the Ruin of whole Families of Ingenious and Industrious men, every striving to build up his house, and raise his Family by the ruins and decay of his Neighbours; But our onely complaint is against the common, and ordinary sort of vile persons, that live after a most sordid manner, and seek not wealth nor greatness, but onely to maintain themselves in a most despicable lazy kinde of life, by filching and stealing from their honest and laborious Neighbours, and against such, that though they steal not, yet oppress, oppugne, and injure those that are more Industrious than themselves.

Against
thieves.

The severe penalty of death being the punishment for theft, is the principal cause of the infinite encrease of thieves, first because many there are (who if they know or have taken a theife) will not indite nor prosecute him, because their conscience will not admit of inflicting so severe a punishment for so small an offence, but will rather bear the loss of their goods, than seek another mans life for it.

Secondly. Some if they take a thief, will rather accept of their goods again and satisfaction, than prosecute him, because in some cases they loose their goods, and are also at the charge of prosecution.

Thirdly, Some also will not prosecute common ordinary thieves that live by stealing Sheep, Corn, Wood, Poultry, Swine, &c. and have Families to maintain by this very trade, lest they (being part of the parish) be bound afterwards to maintain their Families, and thus are the conditions of many places in England.

Fourthly. When thieves are taken and prosecuted and come to their trial, they being for their lives, no evidence will, nor ought to be taken but what is very cleer, and where it is so against one, either through mistakes, or willful omissions, it is deficient against five, by which means many of those few that come to trial are found not guilty.

Fifthly, When they are upon trial, and the evidence cleer against them, either the Jury are tender of their Neighbours life, or else some good friend or other appears, that it is found but *Petit Larceny*, or else the thief has his Clergy, or by some such shift,

or

or means, or evasion, he gets off; So that it may be as it often happens a thief comes five or six times to his trial, or at least to Goal before he is hanged, during which time he grows more subtle, and educates many other in the same profession, and teacheth them all manner of tricks and devices, not onely to effect their intentions, but to avoid the punishment.

To remedy which, were to make the Penalty more moderate, and without respect or favour to be assuredly executed, it would much lessen their number.

As suppose the penalty of all manner of theft were to be transported to the *West-Indies*, or to be confined to some certain *Mines* or such like, at the pleasure of the *Judge*, and to have an apparent brand or mark in the face, and that it should be free and lawful for any man to kill any such person returning or straying from such Employment, and that every one that lost their Goods, and did prosecute the Thief should have their dammages and costs restored, I suppose none would make any scruple of prosecution, nor would any endeavour to preserve these *Vipers* from so moderate, yet sufficient punishment.

This way if severely prosecuted without favour or respect, would in a little time rid the Countrey of the old Thieves, and their very breed also, that there would scarce be any of their blood remaining; But if any should by chance appear, he would hardly have any time to learn his trade perfectly.

But until some such law be established, which we humbly leave unto our *Grand Patriots* to consider of, on whom we *Rusticks* depend for good and wholsom *Laws*, to preserve our *Interests*, which will the better Capacitate us to serve his *Majesty*, and answer his *occasions* with our *fortunes*, as well as with our *Lives*, and will also the better enable us to pay our *rents* unto them, and improve their and the whole *Kingdoms Revenues*.

In the mean time (I say) let us endeavour the preservation of our goods from these *Vermine*, and Children of darkness, by such means; and by what what Industry we are capable of, as by diligent and careful watching, *Quæ enim res quotidie videntur, minus vana metuant furem*, by making good and secure fences, and by having our *doors, walls, and windowes* of our *Houses, Barns, Stables, Gardens &c.* well fortified against them.

We shall not here contend with any, whether the rules of *Astrology* to discover theft, the making or laying of *Charms, Spels, or Sigils*, to prevent theft, or the art of enforcing the *thieves* to bring back goods stoln, be lawful or not, *quæ supra nos, nihil ad nos*.

But if I know the certain or probable haunt or way the Thief useth, I may safely make use of some *Ginn* or snare to keep him by the legs, or otherwise, till I come and release him, or I may place certain sharp spikes of Iron in the ground, and strain some pieces of small brass wyer athwart the way neer the ground on either side of the sharp spikes, (which wyer and spikes are not visible by night) that when Mr. Thief walks and thinks not of it, by stumbling at the wyer, he falls on the spikes which gives him

such marks that you may perhaps know him against another day.

Or you may run wyers across your backside, the ends whereof may be fastened to some lock of a Pistol, or such like, that by the touch onely of the wier the Pistol may be discharged, which will give you notice and also terrifie the Thief and may be so placed that it may shoot directly towards him.

Or you may have a bell to ring onely by the touch of such a wire, which may terrifie the Thief and give you notice.

A good *Mastiff* is a singular Preservative to a Backside against such are not of his acquaintance, or that know not how to charm him, which few Countrey Thieves understand, but if he be kept within doors, he is a sure defence against Burglary, and out of the charmers power; The small bawling curs are the surest watchers, and are good to rouze up the *Mastiffs*.

ill Neighbours. *Noxa tam magna est, malus vicinus, quantum bonus commodum; Hesiod.*

What a grief, loss, and inconvenience, it is to be confined to dwell by ill Neighbours, how it multiplies our cares, and increas- es our labours, and lessens our stockes and profits, how are we disquieted at the sight of them, and how are our Fruits destroy- ed, and our Corn spoyled by them, and their Cattel, who are continual trespassers, especially if they think we are so peaceably given, as to put up small injuries, or that we are unwilling to seek remedies worse than the disease? against these enemies to our good Husbandry, and to our otherwise most happy life, we have no remedy but patience the best of virtues.

Yet some policy may be used to charm these *Crocodils*, to make these furies friends, please a little their natures, and feed their humours in what they delight, by being their seeming friends you may commend them; and they will be as ready to serve you, as to prosecute another Neighbour that less deserves, onely because he uses not the same method of Policy; if they love their bellies invite them often, *Eum potissimum vocato, quincunque te prope habi- tat*, be sure to please them that are most capable of doing you hurt; what ever they delight in, please them in it, and you have done enough, for you know not what need you may have of a Neigh- bours help, sometimes it may thieves may assault you, sometimes you may want some particular instrument, that your Neighbour hath, without which or whilest you go farther, you suffer great loss, and what a sad thing it would be to be denied, as *Hesiod* in his time observed.

Ne tu quidem petas ab alio, illeque recuset, tu vero carcas,

CHAP. XI.

Of the several sorts of Instruments, Tools, and Engines incident to this Profession of Agriculture; and of some Amendments and profitable Experiments in Building, either by Timber, Stone, Brick, or any other way.

*Diæcunt, & quæ sint duris Agrestibus Arma;
Quæ sine nec potuere feri, nec surgere Messes.*

Virgil.

IT is impossible to go through the many^d difficulties in this Art, without many and several sorts of Tools and Instruments, as Ploughs, Carts, &c. It is also difficult and unprofitable, to make use of such Ploughs, Tools, and Instruments, that are troublesome, heavy, and chargeable, when the same labour may be as well performed, if not better, with such that are easie, light, and not so costly; Therefore I shall in this Chapter discover unto you, all the several sorts of Instruments, necessary for the Husbandman, and what inconveniencies have been found in some of them, and the remedies, and what new ways or methods have been of late discovered, to facilitate his labours, as I finde them dispersed in several Authors, and have observed the same in several parts of this Kingdom; This instrumental part of Agriculture being not of the least concernment, and shall also discover unto you several profitable experiments and directions in building, necessary to be known.

Sect. I.

Of the several sorts of Ploughs.

And first I shall begin with the Plough, the most necessary Instrument, the cheifest of all Engines (as *Gabriel Plat* terms it) and happily found out.

There is a very great difference in Ploughs, that there is scarce any sure rule for the making of them, and every Countrey, yea almost every County differs, not onely in the Ploughs, but even in every part of them.

Ploughs also do not onely differ according to the several customs of several places, but also as the Lands do differ in strength or weakness, or the different nature of the Soyl.

To

Double wheel-
ed Plough.

English Im-
prover.

Turnwrest-
plough.

Single wheel-
plough.

Legacy.

English Im-
prover.

Plain-plough.

Double plough.

English Im-
prover.

Another sort of
double plough.

To describe them all is not a work for this place, but I will give some brief descriptions of the more principal sorts of Ploughs, of the greatest esteem, and first of the *double wheeled Plough*, which is of most constant use in *Hartford-shire*, and many other Countrys, and is very useful upon all flinty, stony, or hard Gravel, or any other hard Land whatsoever, its esteemed a useful and necessary Plough, these require a greater strength than other *Ploughs*, and to be used in such places where other Ploughs will not to any purpose: It is usually drawn with Horses or Oxen, two a breast, the Wheels are usually eighteen or twenty inches high, in some places the Furrow-wheel is of a larger circumference, than th'other that goes on the solid Land,

There is another sort of *double wheeled Ploughs*, called the *Turnwrest-Plough*, which surpasseth for weight and clumlines, and is called the *Kentish-plough*, being there much used.

The *one wheel Plough* is an excellent good one, and you may use it on almost any sort of Lands, and is of that shape and form that will admit of more lightness and nimbleness, than the other *Wheel-ploughs*, being the same that Mr. *Hartlib* speaks of to be made near *Green-wich*, by one who had excellent Corn on barren Land, and yet ploughed his Land with one horse.

This Plough neatly made and very small, hath been drawn with one Horse and held by one man, and ploughed one Acre a day at sowing time, in a moist season, there hath been with six good Horses, six men, and six Ploughs, ploughed six Acres a day at sowing-time, in light and well wrought Land, this seems to accord with the Plough used in *Hesiods* time, where the Plough-man did both guide and drive, *Extremum fira manu capiens, stimula bovum terga attigeris.*

There is a sort of Plough made without either Wheel or Foot, described at large by Mr. *Blith*, to be the most easie going Plough, and of least workmanship, burden, or charge, called the *Plain-plough* fit for any Lands, unless in irregular extream Land, either for stones, roots, or hardness, and there adviseth to the double wheeled Plough, being of strength to supply extremeties and cases of necessity.

Mr. *Blith* describes a double Plough, the one affixed to the side of the other, that by the help of four Horses and two Men you may plough a double portion of Land, the one Furrow by the side of th'other, this he esteemeth not to be of any great advantage above the other plain Plough, yet may be of good use on some Lands.

There is another sort of double Plough, much exceeding the other, as Mr. *Hartlib* in his *Legacy* testifies of an Ingenious young man of *Kent*, who had two Ploughs fastned together very finely by the which he ploughed two Furrows at once, one under another, and so stirred up the Land twelve or fourteen inches deep.

This is one of the best additions to the Plough if thoroughly prosecuted, for most Land requires a deeper stirring, than is ordinarily given it by the usual way of Ploughing, as is evident by those

those experiments that have been made in digging and setting of Corn, this way also comes neer that of digging, and in some cases excells it, because it onely looseth and lightneth the Land to that depth, but doth not bury the upper crust of the ground so deep as usually is done by digging; it is also much easier to plough deep with this double Plough, than with the single, because it beareth not so great a burden, but the one part thereof is discharged, before the other is taken up.

Some have made a Plough with a Harrow affixed thereto, others have designed a *Plough to plough, sow, and harrow* all at the same time, but seeing they are of no great Advantage to the laborious Husbandman, onely invented to satisfy the minds of some scrutinists, I leave them. *Other sorts of Ploughs.*

Of all which several sorts of Ploughs, there is great variation in the several parts of them, some differ in length and shape of the Beam, some in the Share, others in the Coulter, and in the handles, the differences are so many that no one Plough-man knoweth all.

The abuses, faults, and errors incident to the Plough, are many, some in the Workmen and Drivers, who when they are wedded to an old erroneous custom, though never so evidently discovered, will not recede from it, or in the Plough it self, as when it is made too big and cumberfom, & disproportioned, the one part too large, or too little for the other, and when it is rough and ill compassed in the share, when the handles are too short, or too upright, the Irons dull, and many other faults there are which greatly hinder the Husbandmans ease and Advantage, and which ought to be remedied, and if you will have your Plough do you service and gain you Advantage, it ought to have these several good properties, or as many of them as you can obtain. *Errors of the Plough.*

It ought to be well proportionated for strength, according to the nature or strength of the ground you are to plough, that the Irons be sharpened and wear bright; also the shorter and lesser any Plough is made, having its true pitch, with its true cast on the *Shield-board* and *short Wreſt*, and *sharp Irons*, the far easier. *Good properties of a Plough.*

What else is necessarily requisite in the Plough, you may better finde by your manual and ocular experience, than by all the instructions that can here be given, (as in Plautus) *Pluris est occultatus testis unus, quam auriti decem.* Yet if you are desirous to read the large descriptions of the several sorts of Ploughs now in use, with all their diversities of *Coulters*, *Shares*, *Shield-boards*, *Wreſts*, &c. I refer you to the *English Improver*.

There may be other Ploughs made for several uses not usually known, as lightly to pare off the Turf of soarded Land as they usually do that most laborious way with the *Brest-plough*, to be burnt on heaps after it is turned and dried, this would save the greatest part of the expence of burn-baiting, and be every whit as well, if not better. *A turfing Plough.*

I have heard of Ploughs drawn with Mastive Dogs, others promise much of Ploughs driven by the wind, but these I esteem as fruit-

fruitless to the laborious Husbandman, and rather the product, of superficial Ingenuity.

Chap. 4.

Concerning Ploughs or Instruments for the making the Furrow, sowing the Corn, and covering of it with the same Plough, with the several other uses of that and other Ploughs, you will finde discovered in their proper places.

Sect. 2.

Of Carts and Waggon.

Contrary to the
opinion of some

There are several sorts of *Waggon*s, *Carts*, &c. some with four, some with two Wheels, and also for several uses, either for the carrying of Timber, Corn, Dung, or such like, all differing the one from the other, according to the several places, whether hilly, level, stony or clayey, or to the several occasions for which they are intended; in some places they are much more curious in the forming of them, making them neater, lighter, and slenderer, as well in the Wheels as in the other parts of the Cart or Waggon. The Wheels the more upright or square the Spokes are from the Box or Center, the weaker they are when they come to bear on either side, to that end they make them concave or dishing, and also to secure the Wheel from breaking in a fall; the greater the circumference of the Wheel is, the easier is the motion, because the ring or bond of the Wheel is the more flat, and doth more easily over-pass any stones, or other obstructions in the way, and sinks not so easily into the concavities or defective places of the Earth, its motion is also slower at the Center; for the greater Wheel of eighteen feet in the circumference, goeth but once round in the same measure of ground, where the lesser Wheel of nine feet in the Circumference goeth twice, and so according to the same rule and proportion, where the difference is greater or lesser; Therefore the lesser the Wheel is of any *Cart*, *Waggon*, or *Plough*, the heavier it goes, and more unevenly or jogging, the reason of the lesser Wheels in a Waggon being onely for its convenience in turning.

New sort of
Carts.

The higher a Cart or Waggon is set, the more apt it is for overturning, but because the setting of it low, and the height of the Wheels after the usual way of placing them, cannot consist together, therefore it may prove very commodious to place the bed of the Cart under the Axle-tree, at such distance as the depth or shallowness of the ways or waters you are to go through will bear, for by this means part of the weight will be under the Axle-tree, which will so far counterpoise what is above, that it will very much prevent the overturning or oversetting the Cart or Waggon, for we evidently see that the higher a Load lyeth, whether it be Hay, Corn, Straw, &c. the easier it oversets, and the lower it lies, as stones, mettals, &c. the more rarely, if you make the tail of the Cart or Waggon turning upwards, I cannot perceive any inconvenience can arise from this way.

They are much more curious in making of them in some places
th

than in other, as in *Holland* they make them very neat and light, one Horse shall effect as much with a slender, neat, and light *Cart* and *Wheels*, as two shall with a cumberfom heavy one.

In *China* Waggon's are made to pass frequently with *Sayls* like *Waggon with Sayls* (as *Historiographers* relate) its probable their *Winds* are more certain and constant, and their ways more level than they are here. in *Holland* a Waggon was lately framed, which with ordinary *Sayls* carried thirty people, sixty english miles in four hours, *Hardly's Letter*. I have seen much done of this nature, and more might be done, as to make a *Cart* or *Waggon* move against the *Wind*, and the more the *Wind* blowes the faster it shall move against it, by the help of the perpetual *Skrew*, &c. but these being not to our present purpose of Advantage, I shall leave to others.

Sect. 3.

Of several other Instruments used in digging, &c.

The *Trenching-plough* or *Coulter* is a certain Instrument used in *Meadow* or *Pasture Ground*, to cut out the sides of *Trenches*, *Carriages*, or *Drains*, or it is used in cutting out the sides of *Turf*; for the taking of it up whole, to the intent to lay it down again in the same or some other place; It is onely a long *stale* or handle with a button at the end for ones *Hand*, and at the other end it turns up wards like the foot of a *Plough*, to slide on the *Ground*, in which bend must be placed a *Coulter* or *Knife* of that length you intend the *Turf* to be in depth. *Of the trenching Plough.*

Several fashions there are of them, some with one *Wheel*, some with two, some with none, you may make them as you please.

There are many sorts of *Spades* according to the diversities of *Of Spades.* places, and the several occasions and humours of men.

One sort is made very thin, light, and sharp, with a *Socket* to put the *Stayl* in, like the *hedging Bill*, the bit very short and not very broad, in shape much like a *Spade* in *Cards*, of very great use to some (though hardly known to others) to under-cut the *Turf* after it is marked out with the *Trenching-plough*, which it doth with much ease and expedition. *Turfing-spade.*

For the cutting *Trenches* in watry, clayey, or morish *Lands*, they usually use a *Spade* with a *Langet* or *Finn*, like a knife turned up by the side of the *Spade*, and sometimes on both sides, to divide the *Clay*, or moist *Earth*, and cut the small *Roots* that it come clean away. *Trenching-spade.*

The ordinary *Spade* is made several ways, but the most commendable are the lightest and thinnest wrought, not wanting their due strength, the cleaner they are kept the better they work. *Common Spade.*

The *How* is an Instrument of very great use, and it is great pity its no more used, if the spare times of the year (except when the *Earth* is frozen) were but made use to how the several *Creeks*, *Corners*, and *Patches* of your *Land*, it would undoubtedly prove a very great Improvement: more hereof in their proper places. *The How.*

Besides the *Spade* and *How*, and their kinds, there are several other *Chap. 4.* *Other Instruments used in digging, &c.*

other *Instruments* used by the Husbandman, for the grubbing and raising of Trees both great and small, and *Bushes, Brakes, &c.* and for the making holes and passages in hard and stony Lands, for several occasions, and for the loading and spreading of *Dung, Earth, &c.*

As *Mattocks, Pick-axes, or Grubbing-Axes*, and also the great Instrument described by Mr. Platt, for the quick riddance of Shrubs, Broom, and such like, mentioned before Chap. 10. The *Iron-crow* or *Iron bar*, are not to be wanting, also *Shovels*, the *Dung-fork*, *Mole-spades*, or *Paddle-staffes*, you will sometimes have occasion for.

Sect. 4.

Other various Instruments.

Utenfilia vero domi omnia apta facito :

Ne tu quidem petas ab alio, illeque recuset, tu vero careas.

Hethat goes a borrowing goes a sorrowing, is an old and true Proverb; Therefore it behoves our Husbandman that intends to thrive, to possess or furnish himself with all things necessary, as well of present necessity for his occupation that he may not put himself to the trouble of borrowing, nor the damage he is likely sustain for want of, nor the scorn or disgrace of being denied any thing he wants.

That you may not be forgetful of any or at least of the most useful and necessary *Instruments*, besides the fore-mentioned, I will enumerate such as come into my minde, and advise you to add what you finde deficient, and let them be all placed in their proper places, according to *Xenophons* advice, *Supellex et Instrumenta varia Rustica, suo quaque loco & ordine disposita, in promptu sint quoties vel promenda vel requisita seponenda sunt.*

Belonging to the Arable and Field-Land, are

Harrows.
Forkes.
Sickles.
Reap-hooks.
Weed-hooks.
Pitchforks.
Rakes.
Plough-staff and Beetle.
Sledds.
Roller.
Mold-spears and Traps.
Cradle-sythes.
Seed-lip.

To the Barn and Stable

Flayles.
Ladders.
Winnowing-fan.
Measures for Corn.
Sieves and Rudders.
Broomes.
Sacks.
Skeps or Scuttles.
Bins.
Payles.
Curry-combs.
Main-combs.
Whips.
Goads.
Harneys for Horses, and
Yokes

Yoakes for Oxen.

Pannells.

Wanteyes.

Pack-saddles.

Suffingles.

Cart-lines.

Skrein for Corn.

To Meadows and Pastures.

Sythes.

Rakes.

Pitchforks and Prongs.

Fetters and Clogs and Shackles.

Cutting Spade for Hay-reeks.

Horfe-locks.

Other necessary Instruments.

Hand-barrows.

Wheel-barrows.

Dibbles.

Hammer and Nails.

Pincers.

Siffers.

Bridle and Saddle.

Nail-piercers or Gimlets.

Hedging-hooks and Bills.

Garden-sheers.

A Grindstone.

Whetstones.

Hatchets and Axes.

Saws.

Beetle and Wedges.

Leavers.

Shears for Sheep.

Trowels for House and Garden

Hodd and Tray.

Hog-Yoaks and Rings.

Marks for Beasts and Utensils.

Scales and Weights.

An Aul, and every other thing
necessary.

Sect. 5.

*Of Amendments and profitable Experiments
in Building.*

As the *Manners and Customs* of Men are in every Age refined and tend more and more to purity and perfection in these *Northern*, and formerly rude and salvage *Countrys*, or rather grow more exact, and imitate the other more Southerly and first *Civilized* parts in *Language, Manners, Arts, and Sciences*, so do they also endeavour to reform their most grosse, undigested and ill-contrived *Structures and Edifices*, not onely in *Cities and Towns*, but in their *Counrey Villages* also, that we now compare some of our *Cities and Towns* with most of theirs, and even excel them in several, and that not a few, of our most suavious and delectable *Rural Seats*, as well for their *Magnificent, Regular, and Artificial Structures*, and most Ingenious Contrivances, as in their most salubrious, convenient, and pleasant *Scituations*.

And for the future, were but the Rules of *Arthiteſure* duely observed, and those new and compleat *Methods and Models* contrived for Building, and the scituations of places, according to the best judgments taken notice of, in such Buildings that may hereafter be raised, either *de novo*, or in the restoring or redifying of Ancient and decayed Seats, in our *Counrey Villages*, our *England* in a few ages would appear a *Kingdom* beset, and adorned in every part with curious and admirable *Habitations*, possessed with *Noble, and Ingenious Inhabitants*, and would at large represent to the view of all, what *Middlesex* its *Epitome* now doth to the spectators on *Putney-Hill* in a cleer day, and would contract the envy of other *Nations*, as the Land of *Caanan* formerly did.

Therefore let me advise all such that are willing or necessitated to build, that they sit down and consider of the manner, and method of Building, as well as of the charge and expence, and that they will make choice of such Surveyors and Workmen, that understand what they go about, and not be guided or perswaded by such that are wedded to an old deformed custom, who will in no wise consent to a more compleat way, although it be much more beautiful, and regular, and also with less Materials and cheaper, and more convenient than the other, for no other reason but that it is *Novel*, and not as our Forefathers did before us, yet perhaps are willing to bestow expence enough upon it, in enriching it, although but with little Skill or Art; But I suppose it is better to erect that which will be pleasing to, and content both Wise-men and Fools, then that though done by the same cost and expence, which will onely please Fools.

This is a digression from our intended design, and here inserted onely to perswade such that intend any store of Building, to make use of such Authors and Persons that understand that Art, which in this place we do not undertake to teach, onely shall give the Husbandman a few general *Rules* and *Directions* that I have casually met withal, about the scituation and building of a plain Countrey Seat, and the Building of Walls, Barns, Mills, &c.

The scituation
of a House

Prædium Rusticum bonum Calum habeat, &c.

“Let your Countrey House have a good Air, and not open to tempests, seated in a good Soyl, let it therein excel if you can, let it stand under a hill, and behold the South, in a heathy place, let there be no want of Workmen or Laborers, let there be good Water, and let it stand neer some City or Market-town, or the Sea, or some Navigable River, or have a good Road or Way from it. Thus *Cato* advises.

Chap. 6

Little more can be said, but that Woods also as well as Water may be neer it, they being the Principal things that adorn a Countrey Habitation, but if you cannot conveniently seat your House amongst the Trees, yet are there few places but you raise speedily Trees about your House, as before we directed, it being far better to have your House defended by *Trees*, than *Hills*; for these yield a cooling, refreshing, sweet, and healthy Air and shade, during the heat of Summer, and very much break the cold Winds and Tempests, from every Coast in the Winter; The other according as they are scituated, defend onely from some certain Winds, and if they are on the North side of your House, as they defend you from that air in the winter, so do they deprive you of it in the summer, if they are on the South side, it otherwise proves as inconvenient; Besides they yield not the pleasures and contentments, nor the varieties of Oblations to the ingenious Rustick, as the tall Plumps of Trees and pleasant Groves do, yet are Hills cloathed with Coppices or otherwise improved pleasant objects, so that they stand not too neer your House.

Let not your House be too low seated, lest you loose the convenience of Cellars, but if you cannot but build on low Grounds, let

set the lower Floor of your House the higher, to supply the want in your Cellar, of what you cannot sink in the Ground; for in such low and moist Grounds it conduceth much to the dryness and healthiness of the Air, to have Cellars under the House, so that the Floors be good and lied underneath.

It is very inconvenient to build *Barns, Stables*, or such like places too neer to your House, because *Cattel, Poultry*, and such like, require to be kept neer them, which would otherwise annoy your House: let your Garden joyn to one, if not more sides of your House; for what can be more pleasant for the most part of the year, than to look out at the Windows of your Parler and Chambers into a Garden? what sides of your House are not joyning to your Garden, let there be Courts or Yards kept from *Cattel, Poultry, &c.* and planted with Trees to shade, defend, and refresh your House, and the Walls also of your planted, with Vines and other Fruits.

Not to speak of the Building of *Palaces or Seats* for the Nobility or Gentry, but onely of plain and ordinary Farm-houses, I have thus much observed, that Houses built too high in places obvious to the Winds, and not well defended by *Hills or Trees*, require more Materials to build them, and more also of reparations to maintain them, and are not so commodious to the Inhabitants, as the lower built Houses, which may be made at a much easier rate, and also as compleat and beautiful as the other; In Building of a House long, you loose the use of some Rooms, and it takes up more for Entries and Passages, and requires more Doors, and if it be four square there must needs be light wanting in some part thereof, more than if it be built like an H, or some other such like figure, which maketh it stand better and firmer against the Winds, and light and Air comes every way to it, every Room is neer the one to the other: the *Office*, as the *Kitchen, Dary-Rooms, brewing and baking Rooms* are neer unto the Hall, which onely divides between those and the Parlers, &c. several descriptions and draughts of foundations could I give you here, were not the cutting of them too costly for so Rustick a work to bear the Walls where Brick may be had, are best and most securely raised with it, and with little cost if you raise firm and strong *Columns* at the corners of your House, of strength sufficient to support the *Roof or main Beams*, you may build them square, and between them may you raise the Walls with the same Materials, and work them up together with the Corners or Columns, leaving the one half of the extraordinary breadth of the *Column* without, and th'other within the Wall, whereby you will save much cost and charges, both in Materials and Workmanship; and yet your house be firm and strong.

Securest and
cheapest way of
Building a
House.

The heavier any Covering is to a House, the greater is the expence in raising the whole Frame or Building to support it, and the sooner doth it require reparations, therefore healing with Lead or flat Stone is not to be approved of, by reason of its weight, where Earthen Tile, Slate, or Shingle may be had; next unto

Best covering
for a House.

unto Lead or Stone; *Tiles* made of Clay are the heaviest and most in use.

Pantiles, such as come from *Holland*, are the best and lightest Covering of any sort of Tiles, and it is to be admired, at that another Nation can transport so earthy a Commodity, and pay all duties, &c. and sell them at our own doors, at a cheaper rate than we can make them, and yet have we as good Materials and Fuel, more plentiful than they.

Of Tiles,
Bricks, &c.

A composition of Clay, Sand, &c. is easily made for Tiles, that shall make them not onely thinner and lighter, but also stronger and more durable, if ingenious men would undertake it, which are rare to be found in so dirty, yet necessary an occupation, which would save very much Charge and Materials in Building, if it were truly prosecuted.

The same may be said of Bricks, &c. and with such a composition may be made in *Molds*, all Window-frames for a House of different Work and Magnitudes, and Chimny-pieces, and Frames for doors, &c. in several peices made in Molds, that when they are burnt, may be set together with a fine red *Cement*, and seem to be as one entire piece, whereby may be imitated all Stone-Work, now used in Building, and it will very well supply its defect where Stones are scarce, and dear, and also may save very much Timber, which is now used in brick Building, and appear much more compleat, and beautiful, and be of more strength and of longer continuance, than Timber or ordinary Brick, and is very feazible, as we may perceive by the Earthen-pipes made fine, thin and durable, to carry Water under the ground at *Portsmouth*, and by the earthen Backs and Grates for Chimnies, made by Sir *John Winter* formerly at *Cheering-Cross*, of a great bigness and thickness, which are evident and sufficient demonstrations of the possibility of making Work fine, thin, and light; for Tiles either plain or crooked, and for the making of great Work in Molds, and the through burning of them for *Doors*, *Windows*, and *Chimny-frames*, &c.

This is one of the most feazible and beneficial operations that I know in *England* to be neglected.

Of Shingles.

Where either Tiles are scarce, or Timber not very plenty, that you would have your House but lightly covered, *Shingles* are to be preferred before *Thatch*, and if they are made of good Oak, and slit or cleft out, and then well seasoned in the Water and Sun, they become a sure, light, and durable covering.

Slate.

Where it may be had, the thin blew Slate seems to be the best Covering, being very light and lasting.

Thatch.

This is a common Covering in most parts, yet is some to be preferred before others, the best that I have seen is that which is called *Helm*, that is, long and stiff Wheat-straw (with the Ears cut off) bound up in bundles unbruised, which well laid lies thin, lasts long, and is much neater than the common way.

Of Building of
Stone or brick
walls.

It is an usual thing to see thick and tall walls to fall, either by reason of the weakness of the foundation, or the decay of the Cement or Morter through age, which hath provoked several to great

great and unnecessary expences in laying deeper and stronger foundations, and in making the Walls much thicker than usual, when all that extraordinary cost might be saved, by taking notice of these few observations.

First, that streight Walls, though thick, and seemingly strong, yet either by the falseness of the ground, or being obvious to high Winds, or the decay of the Morter, are apt to lean or fall.

Secondly, that Walls built crooked, though thin and weak, are yet more lasting than a streight Wall.

Thirdly, that a Wall built over a river on Pillars or Arches, stands as firm as the rest of the Wall, whose foundation is entire, as I have in several places observed.

Which plainly demonstrates unto us, that a Wall built up much thinner than usual, having at every twenty foot distance (or such like as you think fit) an angle set out about two foot or more, according as the Wall is in height, or having at such distance a *Column* or *Pillar* erected with the Wall 6 or 8 inches or more on each side over and above the thickness of the rest of the Wall, the foundation of such *Jetting* out or *Column* being firmly laid, that it must of necessity strengthen the Wall much more, than if five times the Materials used in these *Jettings* or *Columns*, were used in the Wall being streight, which most evidently saves you a great part of your expence, and your Wall much more firm and compleat; for if it be a Wall for Fruit trees, these Nooks or Corners in the Jettings out, whether *Angular* or *Semicircular*, are secure places for the more tender Trees, or if they are *Columns* or *Pillars*, they make the Wall much the warmer by breaking the motion of the Wind or Air that passeth by it, and these foundations laid secure although at that distance, support the Wall in loose and false ground, as though it were intire, but if the ground be very loose, you may project an Arch from each foundation, though obscurely.

It is a great injury to our Buildings that our Cement is no better, in former ages when they built with small and unequal Stones their Cement or Morter far exceeded ours, as is most evident in the Ruins of old *Monasteries*, *Castles*, &c. where their Morter is far harder, than in any of our more modern Buildings.

It is a great error in Masons, Bricklayers, &c. to let the Lime flacken and cool before they make up their Morter, and also to let their Morter cool and die before they use it, also their Stone and Brick they let be moist before they use them; therefore if you expect your work to be well done and long to continue, work up your Lime quick, and but little at a time, that the Morter may not lie long before it be used, and also with dry Stone or Brick, and be sure your Brick take no water, for all which the Summer is principally to be chused.

The Lime it self also in some places is very weak being made of soft Chalk-stones, the other that is made of harder, is much to be preferred.

In former ages they cut their Timber in the Winter time when the Sap was most out of it, but now by reason of the scarceness of

of Oake (the principal Timber) our Statutes oblige us to fell it in the Summer for the Bark, being necessary for Tanners, &c. by which means our Timber shrinks, chaps, and decays much more and sooner than otherwise it would do, which inconveniences in square Timber are not so apparent as in *Plank, Board*, or such like broad and thin work, therefore in such cases it requires some kinde of seasoning or other to prevent them; if you lay them in the *Sun* or *Wind* they *chap*, or *shrink*, or *cast*.

The best remedy in that case is to lay them in a Pool or running Stream, a few days to extract the Sap that remains in them, and afterwards dry them in the Sun or Air, and they will neither *chap*, *cast*, nor *cleave*: against *shrinking* there is no remedy.

When Timber or Boards are well seasoned or dried in the *Sun* or *Air*, and fixed in their places, and what labour you intend is bestowed on them, the use of *Linsced-oyl, Tar*, or such like oleaginous matter tends much to their preservation and duration. *Hesiod* prescribes to hang your Instruments in the smoak to make them strong and lasting, *timonem in fumo poneret*, surely then the oyl of Smoak, or the Vegetable oyl, by some other means obtained must needs be effectual in the preservation of Timber. Also *Virgil* adviseth the same.

Et suspensa focis exploret robora fumus.

of Mills.

In Ancient times they bruised their Corn in Morters, as may be gathered out of *Hesiods* advice to *Persa*.

Mortarium quidem tripedale sera, pistilum vero tricubitale, Axemque Septempedalem.

Since which most tedious and incompleat way, Mills have been invented, some to be used by hands, as *Guerns*, others to be moved by Horses, others by the Wind, and others by the Water, which last being maintained with least cost, more certainty and most advantage, hath gained the preheminance, and is made use of in every place, where there is Water fit for that purpose, and were there is Imployment, although a little for the ease and convenience of the neer Inhabitants, and for the particular Advantage of the owner, yet very much to the detriment and damage of the Kingdom in general, by injurious obstructions of Water, to the spoyling of much MeadowGround, and by the preventing the use of the Water for that most Advantageous Improvement, of overflowing or drowning of Land, which upon the removal of these Mills might be done, and the Corn as well ground to serve every ones occasions.

Either by Windmills, which may be erected on Hills, in hilly places, and in Plains on any open place, where the Wind may as well grind all your Corn, in places where the Water-mills now stand, as in other places where are onely Wind-mills for many miles together.

Or by the rectification of *Water-mills*, that a less quantity of Water may do that which now requires a greater; To which end many have made very Ingenious attempts, and without question may much be done in it, both in the framing and ordering the

Water-

Water-works, (which we will pass by) and in the contrivance of the Mill it self, which doubtless goes much heavier by the stone they call the Runner, its being so large, and its being encompassed with a Hoop or Case that keeps the Meal to the edge or circumference of the Stone, and much deads its motion, the larger the Runner is, the heavier it moves, which may in some measure be remedied, by making four or five Vents or Passages in several places of the Hoop, to take off the Meal as fast as it is ground, that none may lie to clog the *Runner*.

Or a Mill may probably be so contrived that the Grinding-stone or Runner may be vertical, and of but a small Circumference, the flat and square edge whereof may be fitted into another fixed Stone cut hollow, about the fift or sixt part of a Circle, which Runner by its first motion may dispatch as much Corn in the same time, as a larger the other way; several also of these vertical Stones may be on the same *Axis*, this may be used in all the said sorts of *Mills*.

K k

Kalen

Kalendarium Rusticum;
O R,
MONETHLY DIRECTIONS
FOR THE
HUSBANDMAN.

Being C H A P. XII.

Shewing the most seasonable Times for the performing of his Rural Affairs throughout the Y E A R.

*Operum memor esto tempestivorum
Omnium*———Hesiod.



LONDON, Printed in the Year 1668,

THE
P R E F A C E
TO THE
K A L E N D A R.

R*Uri, sicuti in urbe, singula opera sua habent peculiaris tempora;* There is a peculiar time for most Affaires in the World, but more especially for such Labours and Actions that depend upon the mutable seasons of the Year, which being duly observed is no small Advantage to the Husbandman: *Æphemeridam habeat quid quoque tempore faciendum,* is Florentines advice, that every Countrey-man may have his Draught before him to direct him, and reinforce his Memory, that his multitude of occasions may not so far obliterate those things to his loss and disadvantage, but that he may here daily revive and renew his necessary intentions, and take time by the fore-lock, as *Pliny* observed, *Frontem domini plus prodesse quam occipitum;* For time is a thing so precious, and occasion so precipitous, and where many things are to be done, time let pass prevents the success of our endeavours, and loss and confusion succeeds, *semper autem dilator operum vir cum damnis luctatur;* It is a very great neglect in Agriculture to be too late, it brings a considerable damage, like a backward year that produces a bad Crop, so doth a backward Husbandman meet with small gains; you very rarely finde a thriving Husband behind with his affaires, or a declining Husband so forward as his Neighbour.

Nudus serito, nudusque avato

Nudus quoque metito, si quidem tempestiva omnia voles,

Opera ferre cereris: ut tibi singula

Tempestiva crescant, ne quando interim egeas,

Mendices ad alienas domos, nihilque effitias.

It was *Hesiods* advice to Plough, Sow, and Reap in good time, if you expect a compleat reward of your Labours.

But if it be not in every ones power, though he knew the seasons for all things, to observe them; by reason of the multitude and variousness of business that flows upon the laborious Husbandman, at some certain times of the year more than at other, many casualties also intervening; To such it is advised that they make use of the next opportunity convenient, to do what before they have omitted, yet *Cato* tells you, *Res rustica sic est, si unum sero sereris omnia opera sero fecies,* neglect one neglect all.

There

There are two sorts of Times and Seasons prescribed by the *Ancients*, to be observed in *Agriculture*, viz. of the year, being onely the motion of the *Sun* through the twelve signes of the *Zodiague*, which begets the different seasons and temperatures of the Spring, Summer, Autumn and Winter; And of the Aspects and State of the *Moon* and *Stars* whereof, and also of several Prognosticks of of the mutability, state, and condition of the several Seasons, and their natural inclinations, I shall give you at the end of this *Kalendar* a Breviat, and of such observations as I have found in several ancient and modern Authors, treating of that subject.

As for the times and seasons of the year, from the beginning to the end thereof, every day something is to be done by the *Husbandman*, as was said of a Gardiner, that his work is never at an end, it begins with the year and continues to the next; *Annus in opere rustico absolutus est*, yet is it not every year alike, neither is every place alike, some years, or at least some seasons of the year, prove more forward by two or three weeks or more, at one time than at another, also the scituation of places either better defended from, or more obvious to the intemperature of the Air begets some alterations; In these and such like cases the subsequent *Rules* are to be seasonably applyed, by the judicious *Husbandman*, according as the season happens to be earlier or later, or the different scituation of places requires.

This *Method* in general is the same that hath been used by the most ancient that (I have understood to) have written of *Agriculture*, and also our *Moderns*, as you may observe in *Hesiod*, *Columella*, *Palladius*, *de Serres*, *Augustino*, *Gallo*, *Tusser*, *Markham*, *Stevenson*, and others, and last of all Mr. *Evelin*, his excellent *Kalendarium Hortense*, at the end of his *Sylva*.

I shall endeavour herein to be as brief as I can, I shall add nothing more than what is necessary, and shall leave out such things that are but little to our purpose, and shall begin with the major part of our *Presidents* in the like case, although the year in respect of the *Suns* entrance into *Aries*, and the commencement of the date of the year, begins in *March*, yet *Tusser* declines both, and begins at *Michaelmas*, it being the usual time for the *Farmer* to enter on his *Farm*, the ground being then more easily cleered of its former stock, than at any other time; but seeing that it is no very matterial thing when we begin, our labour having no end, we will tread the most usual Path, decline both extrems, and begin when our days do sensibly lengthen, our hopes revive of an approaching Summer, and our Almanacks gives us a New-years-day.

JANUARY.

Day	Sun rise. h. m.	Sun set. h. m.	
1	Newyears day		
4	8 00	4 00	
6	Twelftide.		
8			Lucida Corona, or the Crown, is with the Sun.
10	Sun in Aqua.		
14			The Lesser Dog-star riseth in the evening.
16	7 45	4 15	
22	Vincent.		
24	7 30	4 30	
25	Pauls day.		
26			The Greater Dog-star riseth in the evening
30	K. Charls his Martyrdom.		
31	7 15	4 45	

Mensis difficilimus hic Hybernus, difficilis ovibus difficilisque hominibus.

THis moneth is the rich Mans charge, and the poor Mans misery, the cold like the days increase, yet qualified with the hopes and expectations of the approaching Spring; the Trees, Meadows, and Fields are now naked, unless cloathed in white whilest the *Countrey-man* sits at home, and enjoys the Fruit of his past labours, and contemplates on his intended Enterprises, now is welcom a cup of good Cider or other excellent Liquors, such that you prepared the *Autumn* before, moderately taken it proves the best Phyfick.

A cold *January* is seasonable: Plough up or fallow the Ground you intend for Pease; Water Meadows and Pastures, drain Arable Grounds where you intend to sow Pease, Oats, or Barley; Rear Calves, Pigs, &c. Lay Dung on heaps, carry it on the Land in frosty weather; hedge and ditch.

Plant Timber-trees, or any Coppice-wood, or Hedge-wood; And also Quick-fets, cut Coppices and Hedge-rows, lop and prune greater Trees.

Feed Doves and repair Dove-houses, cut away Ant-hills, and fill up the holes in Meadow and Pasture Grounds, gather stones, &c. Have special care to Ewes and Lambs; House Calves, Geld young

JANUARY,

young Cattel soon after they are fallen ; Sow Oars if you will have of the best, says old *Tusser*.

In Janivere husband that poureth the Grotes,
Will break up his Lap, or be sowing of Dyes:
Dres sown in Janivere lay by the Wheat
In May by the Hay for Cattel to eat.

Oliver.

PLant Vines and other Fruit-trees, if the weather be open and milde, dig and trench Gardens or other Ground for Pease, Beans, &c. against the Spring, dig Borders, uncover Roots of Trees, where need is, and add such Manure to them as they require ; you may also if the weather prove milde, set Beans and Pease. As yet Roses may be cut and removed. *Garden and Orchard.*

Prune Orchard Fruits and Vines, so that it be not frosty ; nail and trim Wall-fruits, cleanse Trees of Moss in moist weather.

Gather Cions for Graffs, and at the latter end, if the weather be milde, you may begin to graff.

Make your hot Bed and sow therein your choice Sallads, sow **Colleflovers**, secure your choice Plants and Flowers from the injury of the weather, by Covers, by Straw, or Dung ; Earth up the Roots of such Plants the Frosts have uncovered.

Set Traps to destroy Vermine, where you have or sow such Plants or Seeds that they injure.

Dig a Weedy Hop-garden. *Hop-garden.*

Turn up your Bee-hives, and sprinkle them with warm and sweet Wort dexterously ; Also you may remove Bees. *Apiary.*

FEBRUARY.

Day	Sun rise. h. m.	Sun set. h. m.	
2	Candlemas.		Cor Leonis, riseth in the evening.
8	7 00	5 00	Sun in Pisces.
14	Valentine.		Cor Hydræ, riseth in the evening.
15			The Tayl of the Lyon riseth in the evening.
16	6 45	5 15	
23	6 30	5 30	
24	Matthias.		
25			Hydra riseth in the evening.

UT sementem feceris, ita & metes: This is a principal Seed-Moneth for such they usually call *Lenten Grain*; this Moneth is usually subject to much Rain or Snow, if it prove either, it is not to be accounted unseasonable, the Proverb being, *February fill Dike, with either black or white.*

Now sow all sorts of Gray-pease, Fitches, Beans and Oats, Carry out Dung and spread it before the Plough, and also on Pasture Ground, this being the principal Moneth for that purpose.

Plant Quick-sets newly raised, the Spring being so near they will not keep long.

Set Willow-plants, or Pitchers, and also Poplars, Osiers, and other Aquaticks.

Sow Mustard-feed and Hemp-feed, if the Spring prove milde; Feeds your Swans, and make their Nests where the Floods reach them not.

Soyl Meadows that you cannot overflow or water; catch Moles, and level Mole-hills.

Also

FEBRUARY.

Also this is the onely time for plashing of Quick-fets, and a very good season for the shrouding or lopping of Trees, or cutting Coppices.

YOU may yet prune and trim Fruit-trees, and cleanse them from Moss and Cankers. Now is a very good time for Grafting the more forward sort of Fruit-trees, if the weather be temperate. *Garden and Orchard.*

Plant also Vines, or any sorts of Fruit-trees in open weather, trim up your Pallisade-hedges and Espaliers; set Kernels, Nuts, or Stones of Fruit, and other hard Seeds.

Lay Branches to take root, or place Baskets, &c. of Earth for the Branches to pass through.

Sow Annise, Bean, Pease, Raddish, Parsnips, Carrots, Onions, Parsley, Spinage, and other hardy Herbs or Seeds, and plant Cabbage-plants; plant out Colleflovers into warm places: Also plant Liquorice.

Make up your hot beds for Melons, Cucumbers, &c. sow Asparagus. Continue Vermine Traps, and pick up all the Snails you can finde, and destroy Frogs and their Spawn.

Now you may, if the weather prove milde, plant Hops and dresse them that are out of heart. *Hop-garden.*

Half open your passages for Bees, and now may ye remove them. *Apiary.*

LI

MARCH.

MARCH.

Day	Sun rise. h. m.	Sun set. h. m.	
1	David.		
2	6 15	5 45	
10	6 00	6 00	Sun in Aries, Equinoctial.
11			Arcturus riseth in the evening.
16			Lucida Corona riseth in the evening.
17			Calf of the right leg of Boats riseth in the evening.
18	5 45	6 15	
22			Spica Virginis sets in the morning.
25	5 30	6 30	Lady-day.
30			Second Star in the left wing of π riseth in the evening.

Titan doth by his presence now revive,
Things sensible, as well as vegetive.

The beginning of March usually concludes the nipping Winter, the end initiates the subsequent welcome Spring, according to the Proverb, *March comes in like a Lion, and goes out like a Lamb*. If it prove cold, it is seasonable to check the pregnant Buds, and forbid them till a more safe and opportune season, ~~near~~ approaching. If this moneth prove dry, the *Countrey-man* counts it ominous of a happy year for Corn.

suffer.

March Dust to be sold,
Worth Ransom of Gold.

Let Cattel no longer feed on Meadows nor Marshes you intend to mow; have special regard to the Fences both of Meadow and Corn.

About the end of this Moneth you may begin to sow Barley, earlier in Clay than in Sand; you may now rowl Wheat, if the weather prove dry, make an end of sowing all sorts of Pulse. You may now shroud or lop old Trees, and fell Coppice-wood better than at any other season in the year.

This is the onely time for the raising the best Brood of Poultry. It is a good time to set Osiers, Willows, and other Aquaticks; sow the Rye called *March-Rye*.

MARCH,

In this Moneth and the next, you may sow all sorts of French Grasses, or new Hayes, as Clover, St. Foyn, &c. Also now sow Hemp and Flax, if the weather be temperate.

The principal time of the year for the destruction of Moles.

Sow any sort of White Pease, or Hastings.

This is the principal Moneth in the year for Grafting all sorts of Fruit trees. Now cover the Roots of all such Trees you laid bare in the winter preceding, and remove such young Trees you omitted to remove in the better season. *Garden and Orchard.*

Carry Dung into your Gardens, Orchards, &c.

Turn your Fruit in the Room where it lyes, but open not yet the Windows.

You may now transplant most sorts of Garden-hearbs, Sweet-hearbs, and Summer Flowers; make hot Beds for Cucumbers, Melons, &c. Saffron also may now be planted, and Madder.

Now sow Endive, Succory, Leeks, Raddish, Beets, Parsnips, Skirrets, Parsley, Sorrel, Bugloile, Borrage, Chervil, Sellery, Smallage, Allisanders, &c. Also Lettice, Onions, Garlick, Orach, Purslain, Turneps, Pease, Carrots, Cabbage, Cresses, Fennel, Marjerom, Basil, Tobacco, Leeks, Spinage, Marigolds, &c.

Dress up, and string your Strawberry-beds, uncover *Asparagus-beds*, and transplant Asparagus, slip and plant Artichoaks and Liquorice.

Stake and binde up the weakest Plants against the Windes; sow Pinks, Carnations, &c. in this Moneth sow Pine-kernels, and the Seeds of all Winter-Greens.

Plant all Garden-hearbs and Flowers that have fibrous Roots.

Sow choice Flowers that are not natural for our Clime, in hot beds this moneth.

You may now plant Hops, it is a very seasonable time to dress *Hop-garden* them.

Now the Bees sit, keep them close night and morning, if the *Apiary* weather prove ill: you may yet remove Bees.

APRIL.

Day	Sun rise. h. m.	Sun set. h. m.	
1			<i>Arista Virginis</i> riseth in the evening.
2	5 15	6 45	
9	5 00	7 00	
10	<i>Sun in Taur.</i>		
14			<i>Cauda Leonis</i> sets in the morning.
17	4 45	7 15	
23	<i>St. George</i>		
25	<i>Mark Evan.</i>		
26	4 30	7 30	<i>Vergiliae</i> , or <i>Pleiades</i> , rise with the Sun.

Diluculo surgere saluberrimum est. The Mornings now seem pleasant, the days long. The *Nymphs of the Woods* in comfort welcome in *Aurora*.

Hail April, true Medea of the Tear,
That makest all things young and fresh appear;
When we despair, thy seasonable Showers
Comfort the Corn, and cheer the drooping Flowers.

A dry Season to sow Barley in is best, to prevent weeds. If April prove dry, Fallowing is good.

Fell the Timber you intend to barque, if the Spring be forward, cleanse and rid the Coppices, and preserve them from Cattel; keep Geese, and Swine out of Commons or Pastures.

Pick up stones in the new sown Land, sow Hemp and Flax.

Cleanse Ditches, and get in your Manure that lyes in the Streets or Lanes; or lay it on heaps.

Set Osiers, Willows, and other Aquaticks, before they are too forwards.

You

A P R I L.

You may throughout this Moneth sow Clover-grafs, St. Foyn, and all French or other Grasses or Hays.

You may yet Graff some sorts of Fruit in the Stock the beginning of this Moneth. *Garden and Orchard.*

Now sow all sorts of Gardens-seeds in dry weather, and plant all sorts of Garden-hearbs in wet weather.

Plant French Beans, Cowcumbers, Melons, Artichoaks, and Madder, and sow such tender Seeds that could not abide the harder Frosts; set French Beans.

Gather up Worms and Snails after evening showers.

Sow your Annual Flowers that come of Seed, that you may have Flowers all the Summer, and transplant such Flowers with fibrous Roots you left unremoved in *March*; sow also the Seeds of Winter-Greens.

Now bring forth your tender Plants you preserved in your Conservatory, except the Orange-tree, which may remain till *May*.

Transplant and remove your tender Shrubs, 'as Jasmines, Myrtles, Oleanders, &c. towards the end of this Moneth also in milde weather, clip Phillyrea, and other tonsile Shrubs, and transplant any sort of Winter-Greens.

Plant Hops, and pole them in the beginning of *April*, and binde *Hop-garden.* them to the Poles.

Open the doors of the Bee-hives, for now they hatch, that they *Apiary.* may reap the benefit of the flowery Spring, and be careful of them.

MAY.

Day	Sun rise. h. m.	Sun set. h. m.	
1	Phil. & Jac.		Cor Scorpionis sets in the morning.
2			The Greater Dog-star sets in the evening.
3			
6	4 15	7 45	
8			The Goat Star appears.
10			Aldebran sets in the evening.
11	Sun in Gem		Pomahant riseth in the morning.
13			Middle Star of Andromeda's Girdle sets
16	4 00	8 00	with the Sun.
21			Cor Scorpionis riseth in the evening.
26	3 50	8 10	
28			The Bulls Eye riseth with the Sun.
29	K. Charls his return.		

*Cuculus canit, quercus in frondibus
Delectantque mortales in immensa terra.*

THis Moneth ushers in the most welcome Season of the Year. Now gentle Zephyrus fans the sweet Buds, and the Celestial Drops water fair Flora's Garden.

*The lofty Mountains standing on a row,
Which but of late were perrigg'd with Snow,
D'off their old Coats, and now are daily seen
To stand on Tip toes all in swaggering green:
Meadows and Gardens are prankt up with Buds,
And chirping Birds now chant it in the Woods:
The warbling Swallow, and the Larks do sing,
To welcome in the glorious Verdant Spring.*

The Countrey-mans heart is revived (if this moneth prove seasonable) with the hopes of a happy Autumn; if it prove cold it is an Omen of good for health, and promises fair for a full Barn: the pleasure of Angling is now in its splendor, especially for the Trout and salmon.

Now wean those Lambs you intend to have the Milk of their Ewes, forbear cutting or cropping Trees you intend shall thrive, till October: kill Ivy.

MAY.

If your Corn be too rank, now you may mow it, or feed it with Sheep before it be too forward. Weed Corn. In some places Barley may be sown in this Moneth.

Now sow Buck-wheat or Brank, sow latter Pease; Also Hemp and Flax may yet be sown.

Weed Quick-sets, drain Fens and wet Grounds, Twifallow your Land, carry out Soyl or Compost, gather stones from the Fallows, turn out the Calves to graze, overcharge not your Pastures, lest the Summer prove dry; Get home your fewel, begin to burn-bait your Land, stubb or root out Goss, Furze, Broom, or Fern, and grub up such Coppices, or other shrubby woody places, you intend should not grow again.

Sell off your Winter fed Cattel.

About the end of this Moneth mow Clover-grass, St. Foyn, and other French Grasses, now leave off watering your Meadows, lest you gravel or rot your Grass.

Look now after your Sheep, if this Moneth prove rainy, lest the Rot surprize them.

Plant all sorts of Winter-Greens.

Garden and Orchard.

Sow the more tender Garden-seeds, as Sweet Marjerom, Basil, Thyme, and hot Aromatick Herbs and Plants, set Sage and Rosemary.

Cover no longer your Cucumbers, Melons, &c. excepting with Glasses, sow Purslain, Lettice, &c.

At the end of this Moneth take up such Tulips which are dried in the stalk.

Binde Hops to their poles, and make up the hills after rain.

Hop-garden.

Watch the Bees now ready to swarm.

Apiary.

JUNE.

JUNE.

Day	Sun rise. h. m.	Sun set. h. m.
4	3 45	8 15
10	3 43	8 17
11	Barnabas	
13		
16		
20	3 45	8 15
24	John Baptist	
26		
29	Peter Apostle	
30	3 50	8 10

The Head of *Castor* riseth in the morning.
Sun in *Cancer*, Solstice.

Arcturus sets in the morning.
Hydra's Heart sets in the evening.

The *Light Foot* of *Gemini* rises in the morning.

Terra amat Imbrem.

A Shower at this time of the year is generally welcome, now *Phæbus* ascends the utmost limits of the *Zodiack* towards the *Pole-Artick*, and illuminates our most Northern *Climes*, and makes those Countreys that within a few moneths seemed to be wholly bereft of Pleasure, now to resemble a *Terrestrial Paradise*; and gives unto them the full proportion of his presence which in the Winter past was withdrawn, that they partake equally of his light with the more Southern Countreys; The glorious *Sun* glads the spirit of Nature, and the sweet showers now refresh the thirsty Earth, the Grain, and Fruits now shew themselves to the joy of the Husbandman; The Trees are all in their rich Aray, and the Earth it self laden with the Countrey-mans wealth, if the weather be calm it makes the Farmer smile on his hopeful Crop.

This moneth is the prime season for the washing and sheering of Sheep, in forward Meadows mow Grass for Hay.

Cast mud out of Ditches, Pools, or Rivers, this is the best time to raise Swine for breeders.

Fallow your Wheat-land in hot weather, it kills the Weeds.
Arationes eo fructuosiores sunt, quo calidior terra aratur itaque inter solstitium & caniculum absolvenda, saith Varro.

Carry

JUNE.

Carry Marle, Lime, and Manure, of what kinde soever to your Land, bring home your Coals and other necessary Fewel fetcht far off, before the Teams are busied at the Hay-harvest.

Weed Corn, sow Rape and Cole-feed, and also Turnep-feed. Now Mildews or Honey-dews begin to fall.

Minde your Sheep, as we advised you in *May*.

Now begin to Inoculate, beware of cutting Trees, other than *Garden and Orchard.* the young Shoots of this year, pluck off Buds where you are not willing they should branch forth.

Water the latter planted Trees, and lay moist Weeds, &c. at the Roots of them.

It is a seasonable time to distil Aromatick and Medicinal Herbs, Flowers, &c. and to dry them in the shade for the Winter; Also to make Syrrops, &c.

Gather Snails, Worms, &c. and destroy Ants and other Vermine.

Set Saffron, plant Rosemary, and Gilliflowers; sow Lettice and other Sallets for latter Salletting.

Gather Seeds that are ripe, and preserve them that are cool and dry; water the dry Beds, take up your bulbous Roots of Tulips, Anemonies, &c.

Inoculate Jasumies, Roses, &c. Also transplant any sort of bulbous Roots that keep not well out of the ground. Now plant Slips of Myrtle, sow latter Pease.

Dig ground where you intend a Hop-garden, and binde such *Hop-garden.* Hopsto the Poles the winde hath shaken off.

Bees now swarm plentifully, therefore be very vigilant over *Apiary.* them, they will requite your care.

JULY.

Day	Sun rise. h. m.	Sun set. h. m.	
1			First Star of <i>Orions Belt</i> rises with the Sun
2	<i>Visit. of Mary</i>		
8	4 00	8 00	
12			<i>Lucida Corona</i> riseth in the evening.
13	<i>Sun in Leo.</i>		
15	<i>Swithin.</i>		
18	4 15	7 45	
19	<i>Dog-days beg</i>		Lesser <i>Dog-star</i> riseth with the Sun.
20	<i>Margaret</i>		
22	<i>Mary Magd.</i>		
25	<i>James Apost.</i>		
28	4 30	7 30	
30			Greater <i>Dog-star</i> riseth with the Sun.
31			<i>Syrus</i> riseth in the morning.

*Tempore Messis, quando Sol corpus exiecat
Tunc festina, & domum fruges Congrega
Diluculo surgens.*

IN thirsty July would the parched Earth be glad of a moistening Shower, to refresh and revive the scorched Vegetable. Now is there an equal care taken to avoid *Phæbus* his bright and burning Beams, as in the *Winter* the furious blasts of cold *Boreas*. Tempests now injure much the laden Fruit-trees, and standing Corn, to the great detriment of the *Husbandman*.

Now is the universal time for Hay-making, loose not a good opportunity, especially if fair weather be scarce.

Mow your Head-lands, thry fallow where the Land requires it; Gather the simble or earliest Hemp and Flax.

At the latter end of this Moneth Corn-harvest begins in most places, in a forward year.

Still carry forth Marle, Lime, and other Manure; bring home Timber, and Fewel, and other heavy materials.

Wheat and Hops are now subject to much damage by Mildews. Now sow Turnep Seed.

JULY,

IT is now a principal time for the Inoculation of choice Fruits, *Garden and Orchard.*
Roses, &c.

And for the Summer pruning of your Wall-trees, for the making of Cherry-wine, Raspberry-wine, &c.

Cut off the Stocks of such Flowers that have done blossoming, and cover their Roots with new fat Earth.

Sow Sallet-herbs for latter Salletting, and also Pease.

Take away the Snails from your *Mural Trees.*

Slip Stocks and other liguous Plants and Flowers, and lay Gil-liflowers and Carnations for increase, watering them, and shadowing them from the fervent Sun beams. Lay also Myrtles, and other curious Greens, clip Box and other tonfile Plants.

Graff by approach, and Inoculate Jasmines, Oranges, &c.

Transplant or remove Tulips, and other bulbous Roots, some may be kept out of the ground, others immediately planted.

If the Season prove very dry, the watering of the Hops will *Hop-garden.* very much advantage them, and make them the more fruitful; if it prove moist, renew and cover the Hills still with fresh Mould.

Now Bees cast their latter Swarms, which are of little advantage, *Apiary.* therefore its best to prevent them.

Streighten now the entrance of your Bees. Kill the Drones, Wasps, Flyes, &c.

AUGUST.

Day	Sun rise. h. m.	Sun set. h. m.	
1	Lammias.		Orion appears in the morning.
6	4 45	7 15	
8			Cor Leonis riseth in the morning.
10	Laurence.		
13	5 00	7 00	Sun in Virgo.
21	5 15	6 45	
23			Cauda Leonis riseth in the morning.
24	Bartholomew		
27	Dog days end.		
28	5 30	6 30	

Non semper æstas erit facite Nidos.

Now bright Phœbus, after he hath warmed our Northern Hemisphere, retires nimbly towards the Southern, and the fresh Gales of Zephyrus begins to refrigerate the scorching Sun-beams. The Earth now yields to the patient Husbandman the fruits of his Labours: This moneth returns the Countrey-mans expences into his Coffers with increase, and encourages him to another years adventure. If this moneth prove dry, warm, and free from high Windes, it rejoyceth the Country-mans heart, increaseth his gains, and abates a great part of his Disbursements.

You may yet thryfallow; Now also lay on your Compost or Soyl, as well on your Barley Land, as Wheat Land.

Carry Wood or other Fewel home before Winter.

Provide good Seed, and well picked against Seed-time.

Put your Eawes and Cows you like not, to fatting.

This is the most principal Harvest Moneth for most sorts of Grain, therefore make use of good weather whilest you have it.

About

AUGUST.

About the end of this Moneth you may mow your After-grass, and also Clover, St. Foyn, and other French Hays, or Grasses. Geld Lambs.

This is a very good time for inoculation in the former part of this moneth. *Garden and Orchard.*

You may now make Cider, of Summer Fruits, Prune away superfluous Branches from your Wall-fruit Trees, but leave not the Fruit bare, except the red Nectarine, which is much meliorated and beautified by lying open to the Sun.

Pull up Suckers from the Roots of Trees, unbind the Buds you inoculated a moneth before, if taken.

Plant Saffron, set slips of Gilliflowers, sow Anise; Now is beginning a second season for the increasing, and transplanting most Flowers, and other Garden-plants, as Herbs, Strawberries, &c.

The Seeds of Flowers and Herbs are now to be gathered; also gather Onions, Garlick, &c.

Sow Cabbages, Cawlyflowers, Turnips, and other Plants, Roots and Herbs for the Winter, and against the Spring.

Now sow Larks-heels, Canditufts, Columbines, &c. and such Plants as will endure the Winter.

You may yet slip Gilliflowers, and transplant bulbous Roots about *Bartholomew* tide, some esteem the onely secure season for removing your Perennial or Winter-greens, as Phillirea's, Myrtles, &c. its also the best time to plant Strawberries, and its not amiss to dress Rose-trees, and plant them about this time.

Prop up the Poles the Winde blowes down, also neer the end of the moneth gather Hops. *Hop garden.*

Toward the end of this moneth take Bees, unless the goodness of the weather provoke you to stay till the middle of the next, destroy Wasps and other Insects, and streighten the Passages to secure them from Robbers. *Apiary.*

SEPTEMBER.

Day	Sun rise. h. m.	Sun set. h. m.
1	<i>Giles</i>	
6	5 45	6 15
8	<i>Nat. of Mary</i>	
10		
11		
12	6 00	6 00
14	<i>Holy Crofs.</i>	
20	6 15	5 45
21	<i>Matthew Ap.</i>	
24		
27	6 30	5 30
29	<i>Michael Ar.</i>	

N: Star of the left thigh of *Boots* riseth in
Arcturus is with the Sun. (the morn.
 Sun in *Libra* Equinoctial.

Spica Virginis is with the Sun.

Vigil.

*Humida Solstitia, Atque Hyemes Orate Serenas
 Agricola.*

IT is now the *Equinoctial* that bids adieu to the pleasant Summer past, and summons us to prepare for the Approaching Winter, the Beauty and Lustre of the Earth is generally decaying. Our Countrey-men and Ladies do now lament the loss of those beautiful Objects, *Ceres*, *Flora*, and *Pomona*, in their Fields, Gardens, and Orchards, so lately presented them withal; But that their minds and hands are busied in preparing for another return, in hopes of a better Crop: gentle Showers now glad the Ploughmans heart, makes the Earth mellow, and better prepares it for the Wheat, which delights in a moist receptacle: still weather and dry is most seasonable for the Fruits yet on the Trees, the Salmon and Trout in most Rivers go now out of season till Christmas.

This moneth is the most universal time for the Farmer to take possession of his new Farm; get good Seed, and sow Wheat in the dirt, and Rye in the dust.

Amend the Fences about the new sown Corn, skare away Crows, Pigeons, &c.

Geld Rams, Bulls, &c. sew Ponds; put Boar up in Sty.

Beat

SEPTEMBER.

Beat out Hemp-seed and water Hemp, gather Mast, and put Swine into the Woods.

Carry home Brakes, saw Timber and Boards, manure your Wheat-lands before the Plough.

YOU may now make Cider and Perry, of such Fruits as are not lasting, and gather most sorts of Winter-Pears, and some sorts of Winter-Apples, but gather not long lasting Fruit till after Michaelmas. *Orchard and Garden.*

Sow Cabbages, Cawly-flowers, Turnips, Onions, &c. Now transplant Artichoaks and Asparagus Roots, and Strawberries out of the Woods, plant forth your Cabbages and Cawly-flowers, that were sown in *August*, and make thin the Turneps where they grow too thick.

Now plant your Tulips and other bulbous Roots you formerly took, or you may now remove them, you may also transplant all fibrous Roots.

Now retire your choice Plants into the Conservatory, and shelter such Plants that are tender and stand abroad.

Towards the end of this moneth may you gather Saffron.

Now finish the gathering and drying of your Hops, cleanse the *Hop-garden*. Poles of the Hawm, and lay up the Poles, for the next Spring.

Take Bees in time, streighten the entrance into the Hives, de- *Apiary*. stroy Wasps, &c. Also you may now remove Bees.

OCTOBER.

OCTOBER,

Day	Sun rise. h. m.	Sun set. h. m.
3		
4	6 45	5 15
12	7 00	5 00
14	Sun in Scorp.	
16		
18	Luke Evan.	
20	7 15	4 45
25	Crispine.	
28	Sim. & Jude	
29	7 30	4 30

Spica Virginis riseth in the morning.

Canda Leonis sets in the evening.

Hyades sets in the morning.

Rosam, quæ præterit, ne queras iterum.

*Phæbus withdraws his Lustre, and his Rayes
He but obliquely on the Earth displays.*

NOW enters October, which many times gives us earnest of what we are to expect the Winter succeeding; That I may say,

*The Sun declines, and now no comfort yields
Unto the fading Off-spring of the Fields.
The Tree is scarce adorned with one wan Leaf,
And Ceres dwells no longer at the Sheaf.*

If it prove Windy as it usually doth, it finishes the fall of the Leaf, and also shatters down the Malt and other Fruits, leaving neither Leaf nor Fruit.

Lay up Barly-land as dry as you can, Seed-time yet continues, and especially for Wheat.

Well water, furrow, and drain the new sown Corn Land, now is a good time for the sowing of Acorns or Nuts, or other sort of Malt or berries for Timber, Coppice Wood or Hedges-

Sow

OCTOBER.

Sow Pease in a fat and warm Land, you may now plant Quicksets, and also all sorts of Trees for Ornament or for Use, and also plash Quicksets.

Wean the Foals that were foaled of your Draught-Mares at Spring, put off such Sheep as you have not Wintering for.

Follow Malting, this being a good time for that work.

Make Cider and Perry of Winter-Fruits throughout this ^{Garden and Orchard.} Moneth.

Now is a very good time for the Planting and Removing of all sorts of Fruit-trees, or any other Trees that shed their Leaf,

Trench the stiffer Grounds for Orcharding and Gardening, to lye for a Winter mellowing. Now lay open the Roots of old and unthriving Trees, or such that spend themselves too much, or too soon in blossoms.

Gather the residue of the Winter-Fruits; also gather Saffron.

Sow all sorts of Fruit-stones, Nuts, Kernels, and Seeds, either for Trees or Stocks.

Cut and prune Rose trees; Many of *September* works may yet be done, if the Winter be not too forward.

Now plant your bulbous Roots of all sorts, and continue Planting and Removing several Herbs and Flowers with fibrous Roots, if the former and better season be omitted.

This Moneth is the best time to plant Hops; Now also may you ^{Hop-gards:} bag or pack those you dried the last moneth.

Now you may safely remove Bees.

^{Apiary.}

NOVEMBER,

Day	Sun rise. h. m.	Sun set. h. m.	
1	<i>Alballontide</i>		
5	<i>Powder-plot.</i>		
6	7 45	4 15	<i>Leonard.</i>
10			<i>Virgilie</i> , or the <i>Seven stars</i> set in the morn.
11	<i>Martin-mas.</i>		The <i>Bulls Eye</i> sets in the morning.
12	<i>Sun in Sagit.</i>		
16	8 00	4 00	<i>Edmund.</i>
22			<i>Cor Scorpii</i> rise in the morning.
25			Last three bright Stars in the middle of
26	8 10	3 50	<i>Scorpio</i> rise in the morning.
27			The <i>Bulls Eye</i> riseth in the evening.
29			Thirty middle Stars of <i>Andromedæ</i> Girdle
30	<i>Andrew Ap.</i>		rise in the morning.

Virgil.

— Hyems Ignava Colono.

November generally proves a dirty moneth, the Earth and Trees wholly unclothed. Sowing of Wheat and Rye on a conclusion, the Countrey-man generally forsakes the Fields, and spends his time at the Barn, and at the Market. A good fire begins to be welcome.

Wheat may yet be sown on very warm and rich Lands, especially on burn-baited Land.

Fat Swine are now fit for slaughter; lessen now your Stocks of Poultry and Swine.

Thrash not Wheat to keep until *March*, lest it prove foisty.

Lay Straw, or other waste Stuff in moist places to rot for Dung; Also lay Dung on heaps.

Fell Coppice-woods, and plant all sorts of Timber, or other Trees; fell Trees for Mechanick uses, as Plough-boot, Cart-boot, &c.

Break Hemp and Flax.

Now

NOVEMBER.

Now may you begin to overflow or drown your Meadows
are fed low.

Destroy Ant-hills.

Pease and Beans may now be set, some say Garlick, also trench *Orchard and
Garden.*
or dig Gardens.

Remove and plant Fruit-trees, furnish your Nursery with
Stocks against the Spring.

Yet may you make Cider of hard Fruits that are not pulpy.

Prune Trees, mingle your rich Compost with the Earth in
your Orchards against the Spring.

Some very hard Fruits may yet be gathered.

Lay up Carrots, Parsnips, Turnips, Cabbages, Cawly-flowers,
&c. either for your use or to transplant for Seed at the Spring,
cover the Asparagus beds, Artichoaks, Strawberries, and other
tender Plants, with Long-dung, Horse-litter, Straw, or such like,
to preserve them from the bitter Frosts; Also dig up Liquorice.

Now is the best season to plant the fairest Tulips, if the Wea-
ther prove very bitter.

Cover with mattresses, boxes, straw, &c. the tender Seedlings.

Plant Roses, Lilar, and several other Plants and Flowers, the
Weather being open.

As yet you may sow Nuts, Stones, &c.

Now carry Dung into your Hop-garden, and mixed with store *Hop-garden.*
of Earth, that it may rot against the Spring.

D E C E M B E R.

Day	Sun rise. h. m.	Sun set. h. m.	
1			
2			
3	8 15	3 15	
4			Bright foot of Gemini sets in the morning.
5			The Lesser Dog-star sets in the morning.
6			
7			
8			
9			
10			
11			
12	8 17	3 43	Sun in Capricorn, Solstice.
13			Arcturus sets in the evening.
14			
15			
16			Cor Hydrae sets in the morning.
17			
18			
19			
20	8 15	3 45	
21	Thomas Ap.		
22			
23			
24			
25	Christmas.		
26	St. Stephen.		Right shoulder of Orion riseth in the even
27	8 10	3 50	St. John Evangelist. (Sun.
28	Innocents.		Left shoulder of Andromeda rises with the
29			
30			The left foot of Gemini rises in the even-
31			ing.

Virg.

Indue Munimentum Corporis ut te Jubeo.
Chlanamque mollem, et talarem tunicam.

Phasbus now leaves us the shortest days and longest nights, is newly entred Capricornus, the most Southern Celestial Sign, and begins his Annual Return, which very much rejoyceth the Countrey-mans heart, to see a lengthening of the day, although accompanied with an increase of Cold. The Earth is generally fast locked up under its frozen Coat, that the Husbandman hath leisure to sit and spend what Store he hath before-hand provided.

Frigoribus parte agricolæ plerumque fruuntur,
Mutuaque inter se læti convivium curant.

Now

D E C E M B E R.

Now is it time to house old Cattel; Cut all sorts of Timber and other Trees for Building, or other Utenfils: Fell Coppices.

Plant all sorts of Trees that shed their Leaf, and are natural to our English Clime, and not too tender.

Let Horses blood. Fat Swine, and kill them.

Plough up the Land for Beans, drain Corn-fields where Water offends, and water or overflow your Meadows.
Destroy Ant-hills.

You may now set such Fruit-trees as are not very tender, and subject to the injury of the Frost. *Garden and Orchard.*

Also transplant any sort of Fruit-trees in open weather. Plant Vines, and other Slips and Cions, and Stocks for grafting.

Cover the Beds of Asparagus, Artichoaks, and Strawberries, &c. with warm Horse-litter, Straw, &c. if not covered before.

Sow Beanes and Pease, if the Winter be moderate. Trench ground, and dress it against the Spring.

Set Traps for Vermine, and pick out Snails out of the holes of Walls, &c.

Sow, or set Bay-berries, Laurel-berries, &c. dropping ripe.
This Moneth may you dig up Liquorice.

Dig a weedy Hop-garden, and carry Dung into, and mix it *Hop-garden.*
with Earth.

Feed weak Stocks.

Apiary.

Annus in Angue latet.

CHAP.

C H A P. XIII.

Of the Prognosticks of Dearth, or Scarcity, Plenty, Sickness, Heat, Cold, Frost, Snow, Winds, Rain, Hail, Thunder, &c.

WE have in the precedent Discourse, discovered unto you the reasons of, and the best, newest, and most rational Methods and Ways, for the Improvement of any sort of Land capable thereof; and have also given you a *Kalendar* of the most select times and seasons in the year, for the performance of most of Rural Affairs abroad; And also an account of the rising, setting, &c. of several of the fixed Stars, formerly observed by the Ancients in ordering their Rustick Affaires. Yet remaineth there a more peculiar Art or Science equally necessary with (if not more than) any of the former, and that is to foresee or understand what shall or may probably be, before it comes to pass, which is of so great concernment, that could men but attain to it, that alone, were Art enough not onely to raise their own Fortunes, but advantage the whole Kingdom, by laying up Stores in time of plenty, to supply the defects of scarcity.

That there is such fore-knowledge in some measure attainable, from the natural significations or Prognostications of *Comets*, unusual *Meteors*, &c. is most evident, because they are either providentially placed as signes, which must signifie somewhat to come; Or they are Natural or Accidental Causes of some extraordinary and unusual Effects, that always succeed such rare appearances. If we should deprive *Man* of this Spirit or Art of fore-seeing or judging of future things from evident Signs and Tokens, we should instead of making him more excellent, set him a degree below the Beasts and other Animals, who not onely foresee the different changes of the times and seasons, but also prepare for them as in the subsequent discourse will be made appear.

*Solers Natura, & rerum genitabilis Ordo,
Certa suis studiis affixit signa futuræ.*

Avien.

So that we are not naturally incapable of foreseeing what is to be, but we are prejudiced against the thing it self, because superstitious people (and blind as to things divine) have in several Ages doated so much upon their own attainments in this Art, that instead of making a lawful use thereof, they have religiously interposed

terposed it between themselves and the true and living *Spirit*, which hath begotten so great a prejudice against the thing it self, because of the abuse thereof, that it is generally deserted, and neglected, and those that have any the least judgment or insight therein, much scorned and slighted by the vulgar and ignorant sort of People.

Which notwithstanding, (leaving the more sublime Method of predicting things to come in the greater Sphere, not at all conducing to our intentions, nor within our Rustick capacity to write of or apprehend) we will give a brief account of the common and natural significations of usual signs and tokens of *heat, drought, cold, rain, tempests, &c.* on which depend, and from which usually proceed *plenty, scarcity, &c. of Corn, Hay, &c. or the Sicknes or Welfare of Men, Beasts, &c.* All which are very necessary for our Countrey-man to understand, and I hope free from any thing of superstition or irreligion, *Qui hac omnia*

*Sciens operatus fuerit, inculpatur diis,
Auguria observans, & delicta evitans.*

SECT. I.

*Of the different Appearances of the Sun, Moon, Stars, Meteors,
or any other thing in the Air, or above us.*

*Of the motions,
colours, and ap-
pearances of
the seven Pla-
nets.*

The most principal of natural causes of all changes and variations of the seasons of the year, and of the different degrees of heat, cold, dryness, moisture, &c. in those seasons, are first the *Sun*, then the *Moon*, and other of the moveable *Stars or Planets*; But more especially the *Sun*, whose distance or nearness unto us, or rather whose obliquity or perpendicularity in respect of any part of this Globe, doth beget that most apparent variety in the different Seasons, which indeed would be certain, were there not intervening causes that did divert the general influence of the *Sun*, and sometimes aggravate, & sometimes impede the extreams of weather, &c. occasioned by it; but let those alterations in the *Air*, or above us be what they will, there are some certain *Prodromi*, that gives us to understand thereof, and none more than the *Sun*, as principal in the Heavens, next unto it the *Moon*, as *Virgil*

*Si vero Solem ad rapidum, Lunasque sequentes
Ordine respicies; nunquam te crastina fallet
hora.*

Of the Sun.

The *Sun* doth indicate unto us the true temperament of the *Air*, through which we receive its Beams, and according to its *density* or *rarity* thereof do we perceive that *Luminous Globe*, as if the *Air* be serene and cleer, then do we most perfectly receive the Beams of the *Sun*; the weather is then most inclinable to dryness, and according to the winde, so is it either hot or cool, which if it be either East or North-east in the forepart of the Summer, the weather is like to continue dry, and if Westward towards the end of the Summer, then will it continue also dry; but upon the approach
of

of rain the *Air* is usually replete with moist Vapours, which are not of themselves so evidently discernable to the eye, and yet are plainly demonstrated by the *Sun*.

*Sol quoque & exorians, & cum se condet in undas
Signa dabit : Solem certissima signa sequentur.*

Virgil.

Before Rain the *Sun* appears dim, faint, and watrish, which prefageth Rain to follow.

At the rising of the *Sun* if it appear red or pale, and afterwards dark or hid in a black watry cloud, Rain follows; or if the *Sun-beams* appear before the *Sun*-rising, or a watry Circle about the *Sun* in the morning, or if the *Sun* appear hollow, or have red or black clouds about it, at the rising, or if the Beams be faint or short or watrish; *Suspecti tibi sunt Imbres*--- Rain usually follows; For the *Air* being pregnant with moisture, which usually preceeds Rains, &c. doth represent the *Sun* and *Sun*-beams, different in form and colour, from what it appears to be at other times, as some sorts of glafs being interposed doth represent Objects different from what they are.

*At si cum referretque diem, condetque relatum,
Lucidus orbis erit; frustra terrebere nimbis.*

Virgil.

The setting cleer and red, and rising gray, and afterwards cleer of the *Sun*, indicates a fair day to follow.

The appearance of the *Sun* being very red at any time, but especially in the evening, Wind succeeds.

Ceruleus pluriam denunciat, Igneus Euros.

Virgil.

Any redness in the *Air* precede Winds, which colour is caused from the more coagulated or digested viscous moisture, than that which causeth Rain, from which coagulated or digested moisture Windes are usually generated, but the cause of the redness above any other colour, is the same as it is in some Glasses and transparent Stones, which although perfectly white, represent Objects (also white) yet red unto our eyes, as well as other colours, the reasons thereof I leave to the more Learned to discuss.

The same density or coagulation of the *Air* also represents the matutine or vespertine *Sun* or *Moon* larger unto our sight than at other times, and usually preceeds Winde, and the reason why these Orbes appear greater in the morning or evening, than at other times is, because there is more of this dense *Air* interposed between the object and the sight then, than at any other time.

The most principal significatour of the varieties of weather, the Countrey-man esteemes the *Moon* to be, not onely from its configurations and Aspects with the *Sun* and other Planets, which old fashioned *Astrologers* and ignorant *Philosophers* have put into their heads, as that the Change, Full, &c. being in such and such

signes; such weather shall follow, which if true, then should we have the weather every year alike (the same Aspects falling out very neer the same time every year) which every Countrey *Coridon* can contradict.

But also from its Prognosticks of the several changes of weather from its colour and appearance to our eyes, which are more certain and useful for us to follow the same Rules concerning the different appearances of the *Sun*, may also serve for the *Moon*, being all from the same cause.

If one Circle appear about the *Moon*, it signifies Rain.

But if more Circles appear, they signifie Windes and Tempests to follow.

Also if the hornes of the *Moon* appear blunt or short, it signifies a moist Air, and inclinable to Rain.

But that vulgar error of the hanging or tending of the hornes, this or that way, to presage any alteration of weather, is wholly to be rejected, every year they tending the same way, at the same time of the year, and also that error of judging the weather for that *Moon*, by what it is two or three days after the change, which onely demonstrates the natural inclination of the Air at that time, the same Rule may be observed at any other time of the *Moon*.

Of the other
Erraticks or
Planets.

The different Aspects of the Planets one with the other, and also Eclipses do undoubtedly, either occasion or predict various mutations and changes, in most of our sublunary affairs, and more especially in this of the weather. But the ignorance and fordidness of men is such that they onely rely upon the Rules and Precepts of the *Ancients*, and conceive them to be perpetual, when the Aspects of these Planets vary *ad infinitum*, and so of necessity must the effects; also those *Authors* made those observations in such Countreys, where the seasons and variations of weather, more exactly followed the Cælestial configurations, than in these more oblique *Climats*, where there are other concomitant causes intermixed, so that men ought rather to study and observe the different effects, in these parts and times, from those in other Countreys, and also the occasions of such differences rather than to presume too much upon uncertain Rules and Methods, which begets scorn and derision in the Ignorant, who are the onely Enemies to Art.

Scientia non habet Inimicum præter Ignorantem.

And frustrates the expectations, and discourages the Ingenious; For undoubtedly *Eclipses*, *Conjunctions*, *Oppositions*, &c. have some influence on this Globe, though we apprehend them not as we might.

Of Comets, or
blazing Stars.

These unusual and extraordinary appearances above us, are undoubtedly engendred or formed of some vapours and viscous matter, congealed or coagulated, and congregated together into a certain *Mass* or *Lump*, which being more remote from us than the

the Clouds, are represented to our sight through the perspicuous body of the Air, to be round. Their motion is always irregular and uncertain, and according to their substance, whether more or less, gross or subtle, so do they appear either clearer or dimmer to the eye, they are never so dense or gross, but that the beams of the *Sun* penetrate them, which are evidently conspicuous, in the clear and dark nights, except the light of either *Sun* or *Moon* be near it, then the tail (as they usually term it) or beams of the *Sun* penetrating it, are lost or much diminished.

The matter whereof they are compounded or formed is various, according to the part or places of the World, from whence they were extracted, also their digestion or coagulation, is more in some than in others, which manifestly appears by their different *Colours* and Substances, and also from their effects, which onely operate in those parts of the World, where they resolve themselves again.

They neither flame nor burn, as is fabulously supposed, but move as other *Meteors* do from a certain expence of their own substance the one way, which enforceth their motion another.

When they are spent, the *Matter* whereof they are compounded doth tend to this Globe, as all other substances do within the *Magnetick* or *Attractive* power thereof, so that on what part or Countrey of this Globe the matter resides, there may they expect the effects thereof, which are various.

Sometimes great Rains succeed, as it was after the Comet in 584. that it was then believed, a second deluge or universal flood, to have been prepared for the drowning of the whole world.

Sometimes also great heat and drought, as did the next Summer after the Comet in 1472. in *January*, which was of such strength and vehemency, that in some places the fire burst out, &c. also there followed mortal Maladies, loathsome Sickneses, most noysom and infectious, &c. (in *Germany*) of which nature that Comet seemed to be that appeared to us in *England*, in *December* 1664. after which succeeded great drought, heat, and want of Rain, and that great and terrible Plague in 1665. and great heat and drought, and pestilential diseases in 1666, and 1667. and that never to be forgotten fire or burning of *London*.

*At si contigerit plures Ardere Cometas,
Invalidas segetes torrebit siccior Aer.*

Avien.

More might be said both as to their causes, motions, and effects, but as it belongs to higher Capacities than our countrey Reader to apprehend, so it requires the able pens of more sublime Philosophers to treat of.

There are certain lesser *Meteors* that never attain to the magnitude of Comets, yet seem to be composed of the same matter, and to produce like effects, though in a far less degree, they are visible onely in their motion, and seem as though streames of fire issued from them; As the Poet saith,

*Sape etiam stellas, Vento impendente, Videbis
Præcipites Cælo labi, noctisque per umbras,
Flammarum longes a tergo albescere traclus:*

Which are no otherwise *Fire* than the dashing of Salt-water in a dark night, or the moist light of several marine Creatures, or of shining Wood, or of the scraping of Loaf-sugar in the dark.

The light proceeding from these Meteors, is meerly from the expence of their matter by the swiftness of their Motion, which matter being dissipated descends nearer unto this Globe, and afterwards becomes the cause from whence Winds, Rain, Mists, or Fogs proceed, according as the matter is more or less in quantity, or more or less gross or subtile in substance, as is evident from every Country-mans observation and experience.

*Of the fixed
Stars.*

The Ancients relied much on the rising, setting, and appearing of the fixed Stars, *Virgil.*

*Præterea tam sunt Arcturi sidera nobis,
Hædorumque dies servandi, & Lucidus anguis, &c.*

On which days depended their most principal Rules of Agriculture, but it was in those Parts or Climates as we said before, where times and seasons were not subject to so great a Variation as in these.

We therefore need observe no more than their appearances, as they are visible unto us; that is whether they be cleer or dim, or whether they seem to be more or fewer in number than they usually do, &c.

If any of the greater Stars seem to have a Circle about them, or twinkle or appear greater than usual, or appear dim or their rays blunt, or appear fewer in number, you may expect Rain, the Air being inclinable thereunto.

Avien.

*Sed jam sponte sua stellarum lumina marcent
Convenerit Hyberna prænoscere dura procellæ
Nubila.*

Also if they appear very thick, and more in number than usual, it indicates the Air to be rare and thin; and the more capable of Rain, and also prognosticates Tempestuous Weather to follow.

*Of Fire or o-
ther casual ap-
pearances.*

From the same cause as Comets or Shooting stars may also flashes of fire in several formes be produced, which may also presage or signifie the same things to come.

But they are usually more terrible, and from more strong causes, and do usually produce more violent effects, as fierce Tempests, &c.

*Quod si diversis se passim partibus ignes
Excutiant: Verret pelagus sine fine modoque
Turba procellarum.*—

Avien.

If these flashes appear in the form of lightning, without either Clouds or Thunder, Winds and Rain usually succeeds from that Coast the light is observed, if from several Coasts, great Tempests follow.

If the Air seem to be lighter than at other times, the Sun and Moon being remote, it denoteth Winds and Rain to follow.

Before great Sickneses or pestilential Diseases, lights in the Air, &c. have been observed.

Also the Clouds themselves, as they vary in form and colour, or motion, do they indicate unto us the weather we are to expect. *Of the Clouds.*

In a cleer evening, certain small black Clouds appearing, are undoubted signs of Rain to follow; or if black, blew, or greenish Clouds appear neer the Sun at any time of the day, or Moon by night, Rain usually follows.

In a fair day if the Sky seem to be daped with white Clouds, (which they usual term a Mackarel Sky) it usually predicts Rain.

If great black Clouds come out of the North, and appear whitish when neerer to you, and the season be cold and dry, it signifies Snow or Hail.

If Clouds be very high, and move another way than the Wind blows, or than the other Clouds move that are lower, the Wind either riseth or turneth.

If they appear like flocks of Sheep, or of a red colour, Wind also follows.

If small watrish Clouds appear on the tops of Hills, Rain follows as they observe in Cornwall,

When Hengsten is wrapped with a Cloud, a shower follows soon after.

The like they observe of Roseberry topping in York shire, and many other places in England.

If Clouds move towards the Sun, it denotes Wind and Tempest.

If Clouds rest over the Sun at sun rising, and make as it were an Eclipse, it portendeth Windes; if from the South, Windes and Rain.

If in a cleer day single Clouds fly apace, Windes are expected from that place whence they come.

If Clouds grow or appear suddenly, the Air otherwise free from Clouds, it signifies Tempests at hand, especially if they appear towards the South or West.

Mists and Fogs are of divers natures, soon are the effects of shooting Stars and other Meteors, and these are more general, sometimes they are very gross and stinking, they are then to be avoided as much as you can, their significations as to the change of Air are various, if they vanish or fall without a Wind, fair weather usually succeeds. *Of Mists and Fogs.*

The white Mists that usually ascend in a morning from the low grounds

grounds in a cleer Air; if they vanish, or settle again in the Vallies, fair weather succeeds: but if they take to the hills or mount aloft, it demonstrates the watry inclination of the Air, therefore expect Rain.

Of winds.

In the more southerly Regions the Windes are much more certain, than in these, and the effects of them also more certain; For notwithstanding the Rules and Observations of our *English Philosophers*, as to the strict place of the Wind, expecting thence a certain effect, you will such fancies to deceive you; for although the Wind being exactly in the South South-east Point, it rains to day, yet another day the Wind may be in the same place, and it be fair weather; Also that Wind that brings Rain to the one part of this *Island*, may not to another; for I observe the propinquity of the Sea is to be considered; every place lying neerer to some one part of the Sea than another, and on which Coast the Sea is neereſt, that Wind more frequently brings Rain to that place, than to another where the Sea is more remote; Therefore I desire all such that expect any success to their observations, that they quadrate the Rules to the places where they live, and not trust to the observations of other places.

Windes also are of different qualities, according to the several places they either proceed from or pass over, as the *East Wind* is counted propitious neither to Man nor Beast, which I judge partly to be from the Fens or moist Countreys, as *Holland*, the Fens in *Tork-shire*, *Lincoln-shire*, *Cambridge-shire*, &c. from whence Windes usually proceed, and must of necessity prove unwholsom both to Man and Beast, except to those that inhabit on the Western-coast; for the Wind hath sufficiently purged it self by passing over so much Land, as to leave its noxious quality behind it.

Also the *Northern Windes* are more serene with us than the other, one cause I suppose is from the quantity of Land in *Scotland* and *England*, it comes over unto us, as is observed in other Countreys, that from the Continent the coldest, and most serene Windes proceed.

If the Wind turn to the *South* from any other Coast, or remove from the *South* having been long there, it usually brings alteration of weather.

Windes do produce several and various alterations, and effects in the Air, in the Water, and in the bodies of Men and Beasts, as the *South* and *West* Windes are usually more hot and moist, and not so cleer as the other, the *North* and *East* are more cleer, dry, and cold.

Bacon de vin-
tia.

When the *South-wind* blowes, the Sea is blew and cleer, but when the *North-wind*, it is then black and obscure.

The *Eastern* Windes usually make our fresh Waters much cleerer than the *West*.

The *North-wind* is best for sowing of Seed, the *South* for grafting or inoculations.

The *South-wind* is the worst for the bodies of Men, it dejecteth the Appetite, it bringeth pestilential Diseases, increaseth Rheums,

Men

Men are more dull and slow then, than at other times; Beasts also are not to be exempted from these influences.

The *North-wind* makes men more cheerful, and begets a better appetite to meat, yet is injurious to the Cough, Pthifick, and Gout, and any acute Flux.

The *Eastern-wind* is dryer, more biting, and deadly.

The *West-wind* is moist, mild, and calm, and friendly to all Vegetables; the *East-wind* blowing much in the Spring, injureth Fruits by breeding Wormes.

All *Winds* blowing much cleanse the *Air*, still and quiet Summers being the most unwholsom, and subject to pestilential and Epidemical Diseases.

If in great Rains the *Winds* rise or fall, it signifies that the Rain will forthwith cease.

If the Wind vary much in few houres, and then be constant to one place, it signifies the *Wind* to continue long in that place.

If at the beginning of the *Winter* the *South-wind* blow, and then the *North*, it is like to be a cold *Winter*, but if the *North-wind* first blow and then the *South*, it will be a warm and mild *Winter*.

The blowing of the *Winds* from several Coasts (other concomitant causes concurring) are the truest Presignificators of Thunder.

The blowing of the *Winds* aloft with a murmuring or hollow noise, more than below, commonly presageth Rain.

The blowing or compression of the *Winds* downwards causing smoak to descend, &c. more than usual, signifies Rain to follow.

If the *Winds* blow directly downward, and cause a motion on the Water several ways, or force the dust to arise with the *Wind*, which is repercussed by the *Earth*, it also enforceth the *Hay*, *Corn*, or other things in the Fields, up aloft into the *Air*, which denote unto us the crassitude of the Vapours in the *Air*, which by the heat of the Sun, do emit such casual blasts; for they rarely happen but in the Summer and the day time, (yet sometimes when no Cloud is neer) they signifie Wind and sometimes Rain to succeed, other causes concurring, or otherwise extream heat.

But if these Whirl-windes are very great, they presage Tempests to be very nigh, as *Virgil*

*Omnia Ventorum concurrere praelia vidi;
Que gravidam late segetem ab radicibus imis
Sublime expulsam eruerunt; ———
—— immensum Cælo venit agmen aquarum, &c.*

This watry Meteor and the greatest Miracle in Nature, (besides its divine signification) being produced of natural causes, hath also its natural effects, in some Countreys more southward its an ordinary presage of great Tempests at hand, but here various weather succeeds, according to its various appearances and colours.

It is the lowest of Meteors (saith *Bacon*) and when it appears in parts,

parts, and not whole or conjoynd, it produceth Windes, and Rain.

If it appear double or triple, it usually presageth Rain.

If the colours thereof tend more to red than any other colour, *Wind* follows; if green or blew predominate, then Rain.

Of noise, and
stiffness in the
Air.

The Audibility of sounds are certain Prognosticks of the temper of the *Air* in a still evening; For if the *Air* be replete with moisture over us, it depresseth sounds that they become Audible at a far greater distance, than when the *Air* is free from such moisture or vapours, as you may observe in building, the lower and more ponderous the Roof or Floor next you is, the farther and plainer may you hear any thing therein, which is the true cause of of the quick hearing, at the Whispering-place in *Glocester Cathedral*, which is not onely from the closeness of the passage, as is generally conceived, but from the weight and massines of the building over it, the like I have observed in Roomes covered with Lead, Stone, &c. and in places under large *Cisterns* of *Water*.

From whence you may conclude that in such nights or other times, that you hear sounds of *Bells*, noises of *Water*, *Beasts*, *Birds*, or any other sounds or noises more plainly than at other times, the *Air* is inclinable to Rain, which commonly succeeds.

Of Echoes.

The same may be said of *Echoes*, as of other noises and sounds.

Of Thunder
and Lightning.

When it Thunders more than it Lightens, it signifies great Windes; but if it *Lighten* oftner than it Thunders, it signifies great and hasty Showers.

Morning *Thunders* signifie *Wind*, Noon *Thunders* Rain, roring or distant *Thunders* signifie Wind, but cracking or acute *Thunders*, *Winder* and *Rain*.

Of the rarity
and density of
the Air.

According to the opinion and rules of others, and our own observations, we have given you the best & most probable indications of the future changes of the Wind, Weather, &c. from the several and usual appearances, above either certain or uncertain, or accidental; Now it remains that we say somewhat in relation to the temper or qualification of the *Air* it self, deducted from its own being more rare or expanded, or more dense or contracted.

We shal not take any further notice of the nature of the *Air* in this place, than it serves to our present intentions, which is onely to demonstrate unto you, that the *Air* is an absolute body, fluid & transparent, and in several particulars like unto the *Water*, both being penetrable alike by their several inhabitants the *Fish*, with an equal facility piercing the *Waters*, and *Fowls* do the *Air*, they are both nutriments to their several Animals residing in them, they both obstruct the visual faculty alike, as they are more or less dense, they are both subject to expansion, or contraction, but the *Air* more, they are both subject to undulation, as they are fluid.

The *Air* is also capable to support great burdens, as the vast quantities of *Water* that flow over our heads in stormy or rainy weather, which according to the rarity and density of the *Air* do *graduation*, diffuse themselves upon the *Earth*, as is most evident in

in the more hot and *Southerly* Countreys, where the *Air* is more hot and thin, there Rains fall with that violence, as though it were Water poured forth, when in the more *Northerly* where the *Air* is more dense or gross, it distills in immute drops, as it were cribated through the thick *Air*; we also may discern a manifest difference, for in the warmer seasons of the year, the *Air* being then most thin, the *Rain* falls in greatest drops, and in the colder seasons when the *Air* is more dense, the *Rain* distills in smaller.

So that when the *Waters* are above us, or that *Clouds* or *Floods* of *Water* are in being in the *Air*, we have onely to judge whether they incline towards us, or that they are for some other place.

This rarity or density of the *Air*, cannot be judged by the sight, for it is usual when the *Air* it self is most rare, then is it most replete with *Vapours*, &c. as *Water*, the more it is heated the less transparent it becomes.

Neither can it be judged by its *weight* as many do imagine and affirm from fallacious experiments; for the *Air* is not ponderous in its own proper place, no otherwise than *Water* is in the *Sea* in its proper place, although it be asserted by high-flown *Philosophers*, and learned *Pens*, with whom it is besides our primary intentions to contend in this place, it being enough here to discover to our *Countray Reader* these Mysterious Intricacies of Nature (as they would have them esteemed) by familiar examples and demonstrations.

For the true discovery of the nature and temper of the *Air*, as to its density or rarity, we have not met with a more certain or compleat invention than the *Weather-glass*, the various and intricate descriptions whereof we will not insist upon, but take our observations from the most plain and ordinary single perpendicular *Glass*, being onely thus.

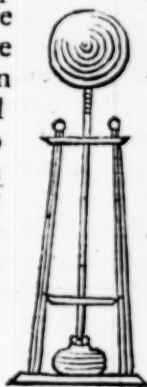
Of Thermometry or the weather-glass.

Procure at the *Glass-house* or else where a *Globular-glass*, with a tub or pipe thereto proportionable, whereof there are many sizes, but be sure let not the pipe too long, lest there be Winter, or fall enough in have a small *Glass* or *Vessel* contain *Water* enough to

Then having fixed them that purpose, heat the warm cloth, to rarifie the the end of the *Tub* into the attract the *Water* more or head.

You may also adde shew you the degrees.

The *Water* you may make blew with *Roman Vitriol*, boyled; or red with *Rose-leaves* dry, and imbibed in fair *Water*, wherein a little oyl of *Vitriol*, or spirit of *Salt* is dropt, with this *Water* fill the under *Vessel*; which being rightly placed on the *North* side of your house, where the *Sun* rarely or never shineth against



head be too big, nor the not rise enough in the the *Summer*; you must also at the bottom, that may fill the *Tub* or more.

in some frame made for *Globe* of the *Glass* with a *Air* within it, and then put lower *Vessel*, and it will less as you warmed the

numbers on the *Glass*, to

it, and in a Room where you seldom make fire, lest the sudden access of heat, or accidental alteration of the Air might impede your observations,

The Air included within the *Globe* or *Ball* of this *Glass*, doth admit of dilatation, and contraction equally with the ambient *Air*, that whensoever the ambient *Air* is dilated or expanded, either through the heat of the season, or before the fall of Rain, &c. the *Air* in the *Glass* is the same; and as by its expansion it requires more room, so doth it let the Water in the Tub descend gradually, and as it is more dense or contracted, either through the coldness of the season, or the serenity or inclinability to drought of the ambient *Air*, so also doth the air within the *Glass* contract it self into a less compass, and sucketh up the Water in the Tub gradually, as it condenseth or contracteth; whence you may at any time exactly know the very degree, or rarity, or density of the *Air* ambient; by that which is included in the *Glass*, and thereby inform your self what weather is most likely to succeed at any time.

Be sure to quadrate, or contemporize your observations or numbers of degrees with the season of the year, for that degree of rarity that signifies rain in the Winter, may be such a degree of density that may signifie fair weather in the Summer.

The differences betwixt the highest rise and lowest fall in one day in the Summer, is much more than in the Winter; for you shall have a cold night and very serene *Air*, which contracteth the *Air* in the *Glass* into a little room, after which usually succeeds a very hot day, which dilateth it very much, when in the Winter no such difference happens.

Yet in the Winter in several days will the difference be as great, as in several Summer days.

Although the *Air* appear serene and cold to your Senses, yet trust not to that, if the *Glass* signifie otherwise.

We shall not give you any sure rule by which you may judge of the weather, but leave it to your own observations, that is, draw on a paper a certain number of lines, as many as you think fit, as Musicians draw lines to prick their tunes on, at the end whereof as they place their key, so number your lines according to those numbers that are next unto the top of the Water in the Tub of the *Glass*, whether seven, eight, nine, ten, eleven, twelve, &c. over this scale mark the day of the moneth, and point of the Wind, in the scale make a dot or prick at what line or number the Water in the *Glass* is at, and by it the hour of the day, and under it the inclination of the weather; at night draw a line downright like the Musicians full time or note; the next day mark as before, until you know and understand the nature of your *Glass*, and the place it stands in, and the season of the year, so that then you shall be able at any time to give a probable conjecture of whatsoever is to be known or signified by that Instrument, which otherwise you shall hardly do.

Of the Baro-
scope.

This new invented instrument, which is termed the *Baroscope*, by which the Authors thereof pretend to discover the temper and inclina-

inclination of the *Air*, from its weight, (in brief) is thus described: Seat a glass *Tub* hermettically at the one end, fill it almost with *Quicksilver*, and invert it, resting the open end in a Vessel of *Quicksilver*, then the *Quicksilver* in the *Tub* by its weight presseth downwards into the Vessel, and so distendeth or streineth the *Air* (which is but little) remaining in the Glass, that the Sumity of the *Tub* is for a small space void of *Quicksilver*, so far as that small portion or remainder of *Air* is capable of distention, which is much more by *Quicksilver*, the most ponderous of fluid bodies, than by *Water* in the Weather-glass, but they pretend that this Column of *Quicksilver* in the *Tub*, is supported by the weight of the *Air* ambient, pressing on the stagnant *Quicksilver* in the Vessel, and that as the *Air* becomes more or less ponderous; so doth the *Quicksilver* in the *Tub* rise or fall more or less accordingly, which if it weretrue, then in case the stagnant *Quicksilver* were broader in a broader Vessel, would the greater quantity of *Air* press harder upon it, and the *Quicksilver* in the *Tub* rise higher, but it doth not; also if the *Quicksilver* in the *Tub* were supported by the pressure or weight of the *Air* on the stagnant *Quicksilver* in the Vessel, then would not the *Quicksilver* descend by the making of some small hole on the top of the *Tub*, which we evidently perceive to do.

Also when the *Air* is most rare or dispaned, and by consequence less ponderous (if any weight thereof should be supposed) then will the Column of *Quicksilver* in the *Tub* be higher, and when the *Air* is more dense or burdened with moisture, then will it be lower; The contrary whereof would happen if their *Hypothesis* weretrue.

But most evident it is, that as the ambient *Air* becomes more or less rare or dense, so doth the *Air* in the *Tub* contract or dilate it self, which is the sole cause of the rise or fall of the *Quicksilver*.

Much more might be said herein, and also of the *Weather-glass* or *Thermoscope*, but I hope this may suffice to induct inquisitive, and not exact or perfect *Artists*; The full discourse and discovery of the various effects, observations, and conclusions of these Instruments requiring rather a *Treat* peculiar, and proper for them onely.

There is also another Instrument that may be made more exact for any of the aforesaid observations or intentions, and fit for further discoveries, but my occasions will not at present give me leave to perfect it.

SECT. 2.

Of Observations and Prognosticks, taken from the Earth and Water.

If the Earth appear more dry than ordinary, or if it greedily *of the Earth* drink, in Rains lately fallen, or Floods suddenly abate, it signifies more Rain to follow.

If the Earth or any moist or fenny places yield any extraordinary scents or smells, it presageth Rain.

Of the Water. If the Water being formerly very cleer, change to be dim or thick, it signifies Rain.

If dews lie long in a morning on the Grass, &c. it signifies fair weather, the Air then being more serene, and not of an attractive or spungy nature.

If dews rise or vanish suddenly and early in the morning, it presages Rain.

If Marble-stones, Mettals, &c. appear moist, it indicates the inclination of the Air to be moist and subject to Rain.

But if in a morning a dew be on the Glass in the window, and on the inside, it signifies a serene and cool Air, and inclinable to drought.

Of the Sea. If the Sea appear very calm with a murmuring noise, it signifies Wind.

If on the surface of the Sea you discern white froth like unto Crowns or Bracelets, it signifies Wind, and the more plainly they appear, the greater will the Wind and Tempests be.

If the Waves swell without Winds, or the Tide rise higher or come ashore more swift than usual, it presageth Windes.

SECT. 3.

Of Observations and Prognosticks taken from Beasts.

It is a thing worthy of admiration and consideration, how the Beasts of the Field, Fowls of the Air, &c. should be capable of so great a degree of knowledge and understanding, as to foresee the different changes and varieties of seasons, and not from common Observations as Man doth, but from a certain instinct of Nature, as is most evident.

Of Bees or Kine, &c. Several significations of the change of weather, are taken from the different postures of these Beasts, as if they lie on their right side, or look towards the South, or look upwards as though they would snuff up the Air, according to the Poet,

Cicero.

*Mollipedesque Boves spectantes lumina Cali,
Naribus humiferum duxere uocare Succum.*

Avien.

Or if they eat more than ordinary, or lick their Hoofs all about,
Convenit instantes praeoscerere protinus Imbres,
Rain follows forthwith.

If they run to and fro more than ordinary, flinging and kicking, and extending their tails, Tempests usually follow.

Of Sheep.

If Sheep feed more than ordinary, it signifies Rain, or if the Rams skip up and down, and eat greedily.

Of Kids.

If Kids leap or stand upright, or gather together in flocks or herds, and feed near together, it presageth Rain.

Of Ases.

If the Ases bray more than ordinary, or without any other apparent cause, it presageth Rain or Windes.

Of Dogs.

If Dogs howl or dig holes in the Earth, or scrape at the Walls of the House, &c. more than usual, they thereby presage death

to some person in that House, if sick, or at least tempestuous weather to succeed.

If the hair of dogs smell stronger than usual, or their guts tumble and make a noise, it presageth Rain or Snow, or they tumble up and down.

The Cat by washing her face and putting her foot over her Ear, *Of Cats.* foreshews Rain.

It hath been anciently observed, that before the fall of a house, *Of Mice and Rats.* the Mice and Rats have forsaken it.

The squeeking and skipping up and down of Mice and Rats, portend Rain.

—Parri cum stridunt denique Mures,
Cum gestire solo, cum ludere forte videntur,
Portendunt crasso consurgere Nubila Cælo.

Avien.

Of all Creatures the Swine is most troubled against Wind or Tempests, which makes Countrey-men think that onely they see the Wind. *Of Swine.*

They usually shake straw in their mouths against Rain, as *Virgil* — *Ore solutus*

Immundi meminere sues jactare Maniplos :

If they play much it signifies the same.

Sect. 4.

Of Observations and Prognosticks taken from Fowl.

As Beasts, so have Birds a certain fore-sight of the change of weather and alteration of the seasons, and especially Water-fowl, *Of Water-fowl.* which if they fly or gather together in great flights, and from the Sea or great waters hasten to the Banks or Shore, and there sport themselves, it denotes Windes, more especially if in the morning.

If the breast bone of a Duck be red, it signifies a long Winter, if white the contrary.

Ducks and Geese, &c. picking their wings, washing themselves much, or cackling much, signifies Rain.

Also Sea-fowl seeking after fresh waters, signifie an open or wet season.

*Jam varias Pelagi volucres, & quæ —
Dulcibus in stagnis vimantur, &c.*

Virgil.

If they betake themselves to great Waters, it presageth cold; If Water-fowl forsake the Water, it signifies that Winter is at hand.

If Land-fowl gather towards the Water, and shake their Wings, making noises, and washing themselves, it portendeth Tempests at hand. *Of Land-fowl.*

If small Birds gather together in flocks, it signifies cold and hard weather at hand.

If Birds seek shelter in Barns or Houses more than usual, it presages cold and hard weather.

If

If Birds fly hastily to their nests, and forsake their meat, it foresheweth Tempests.

If in frosty weather Birds seek obscure places, and seem dull and heavy, it signifieth a sudden thaw.

The early appearance of *Field-fares* or other forrein Winter Fowl, presageth a hard Winter.

Rooks, Owls, Jays, or such like wild Fowl, frequenting a Town more than usual, presage mortality or sickness to that place.

Of the Heron. If the *Heron* soar high seemingly even to the Clouds, it signifies Wind.

If the *Heron* stand melancholy on the Banks, it signifies Rain.

If the *Heron* cry in the night as she flies, it presageth Wind.

Of the Kite. If the *Kite* soar high, it signifies fair weather.

If they make more than ordinary noise or crying for prey, it presageth Rain.

Of the Crow. If the *Crow* hath any interruption in her note, like the hic-cough, or *croke* with a kind of swallowing, it signifieth Windes and Rain.

Avien.

Tenuit cum stridunt Guttur Corvi
protinus Imbres.

Rooks or *Crows* gathering together in flocks, and forsaking their meat, signifie Rain.

The *Raven* or *Crow* creaking cleer, and reiterating her note, signifies fair weather.

Virgil.

Tum liquidas Corvi presso ter gutture voces
Aut quater ingeminant ———

Of Sparrows. If *Sparrows* chirp earlier or more than usual, it signifies Wind and Rain.

Of the Jay. If *Jays* gather together in flocks, it signifies Rain and tempestuous weather.

Of Bats. If *Bats* fly abroad after sun set, it signifies fair weather.

Of the Owl. If *Owls* whoop at night, it signifies fair weather.

Of the Wood-lark. The early singing of the *Wood-lark*, signifies Rain.

Of the Swallow. If the *Swallow* fly low and near the Waters, it presageth Rain; the coming of the *Swallow*, is a true presage of the Spring.

Of the Cock. If *Cocks* crow more than ordinary, especially in the evening, or if *Poultry* go early to roost, it signifies Rain.

Sect. 5.

Of Observations and Prognosticks from Fishes, and Insects.

Of Sea Fish. If *Porpises* or other *Sea Fish* leap in a calm, it signifies Wind and Rain.

Of fresh water Fish. If great numbers of the fry of *Fish* are generated in *Lakes* or *Ditches* where *Fish* rarely come, it presageth great scarcity of *Corn*, or death of *Cattel*.

If Fish leap more than ordinary in Ponds or Rivers, it presageth Windes and Rain.

Great quantites of *Frogs* small or great, appearing at unusual times, and in unusual places, presage great Dearth of Corn, or great Sickneses to follow in that place where they appear. Of Frogs.

The croaking of *Frogs* more than usual in the evening, signifies Rain.

The early appearing of *Snakes*, signifie a dry Spring and a hot Summer. Of Snakes

If they play much in the Water, it signifies Rain.

If the Ant brings forth her Eggs, it presageth Rain. Of Ants.

If *Bees* fly not far, but hover about home, it presageth Rain; or if they make more haste home than ordinary, a storm is at hand. Of Bees.

If they bite more keenly than at other times, it signifies Rain. Of Gnats, Flies

If *Gnats* or *Flies* swarm or gather together in multitudes before sun set, it presageth fair weather. and Fleas

If greater numbers of them appear more than ordinary, it signifieth Sicknes or Mortality to *Man* or *Beast*, and also scarcity of Corn and Fruits.

The early appearance of these or any other Insects in the Spring, presageth a hot and sickly Summer.

If the *Spiders* undo their Webs, tempests follow. Of Spiders.

— Si solvit Aranea casset
Mox tempestates & nubila tetra cientur.

Arach.

If *Spiders* fall from their Webs or from the Walls, it signifies Rain.

If strings like *Spiders webs* appear in the Air, it signifieth Wind.

If *Spiders* spin and weave their nets much, it presageth Wind.

The great appearances of *Chaffers* or other *Insects*, although they denote a present time of plenty, yet are they omens of a future time of scarcity, and if in very great numbers, of Mortality and Sicknes to Men and Beast. Chaffers, &c.

Sect. 6.

Promiscuous Observations and Prognosticks.

Leaves of *Trees* and Chaff playing or moving without any sensible gale or breath of Wind, and the down or wool of *Thistles* and other Plants, flying in the Air, and Feathers dancing on the Water, presage Wind, and sometimes Rain. Of Trees and Vegetables.

If the herb *Trefoyl* close its leaves, it foreshews Rain.

If the *Oak* bear much *Mast*, it foreshews a long and hard Winter.

If *Oak-apples* engender or breed *Flies*, it is said to presage plenty; but if *Spiders*, scarcity.

If *Trees* bear but little Fruit, it usually presageth plenty; and if much, scarcity.

If the Broom be full of *Flowers*, it usually signifies plenty.

The sudden growth of *Mushrooms* presageth Rain.

1255

Et si nocturnis ardentibus undique testis

Concrefcunt fungi ——— protinus Imbres.

of Fire.

If Coals of Fire shine very cleer, it presageth Wind.

If the Fire in Chimnies burn whiter than usual, and with a murmuring noise, it denoteth *Tempests*.

If the flame wave to and fro, it signifieth *Wind*, the same doth the flame of a Candle.

Avicenna

——— *Si flammis emicet ignis*

Effluus, aut lucis substantia langueat uliro,

——— *protinus Imbres.*

If bunches like *Mushrooms* grow on the wick of the Candle or Lamp, it presageth Rain.

If fire shine much or scald, or burn more than ordinary, it presageth cold; the contrary denoteth the contrary.

If Wood crackel or breath more than usual in the fire, it signifieth Wind, if flame cast forth many sparkles it signifies the same.

If the Oyl in the Lamps sparkle, it signifies Rain.

If *Asbes* coagulate or grow in lumps, it signifies the same.

If the Fire in cold weather burn violently, and make a noise like the treading of *Snow*, it usually presageth *Snow*.

Signs of Rain.

If Salt become moist, it signifies Rain; the same if the Rain raise bubbles as it falls, or if the heat of the Sun be more than ordinary, or Wormes come out of the Earth, or *Moles* dig more than usual.

If after *Rain* comes a cold *Wind*, it signifies more *Rain*.

Signs of Snow.

If in time of great cold the *Air* grow thick, and the cold abate, or if there be a dry cold without *Frost*, or if there appear signs of cold in signs of Rain, it presageth *Snow*.

It is usual that a dry Autumn precedes a windy Winter, a windy Winter, a rainy Spring, a rainy Spring, a dry Summer, a dry Summer, a windy Autumn.

It is observed that how far the *Frost* penetrates the Earth in the Winter, the heat shall in the Summer.

Increase of the Moon.

Many are of opinion that the Air, and time of the *Moon* is to be considered in several rural Affaires, as that the increase is the most fit and best time for the killing of Beasts, and that young Cattel fallen in the increase are fittest to wean, and that it is the best time to plant Vines and other Fruit-Trees, to graft and to prune lean Trees, and cut Wood, to sow Herbs, and gather Tillage, and cut Meadows.

Full.

That at the full Moon it is best to fly Hawks, take Marrow, and take Shell-fish, &c.

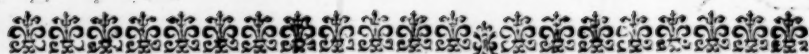
Decrease.

That at the decrease, it is best to geld young Cattel, to fell durable Timber, to gather Fruits, sow and cut Corn, and lay up Corn, to prune gross Trees, to gather grafts, and seeds, and to sow Cucumbers, Melons, Onions, and Artichokes.

Dictionary Rusticum;
OR, THE
INTERPRETATIONS
AND
SIGNIFICATIONS
OF SEVERAL
RUSTICK TERMS,
Used in several Places of *ENGLAND*;
AND ALSO
The Names of several *Instruments* and *Materials*, used
in this Mystery of *AGRICULTURE*,
and other intricate Expressions dispersed in our
Rural Authors.



London, Printed in the Year 1668.



TO THE R E A D E R.

THis Dictionary, above any other part of this Book, may be thought superfluous, because it being intended onely for the use of Husbandmen, they above all others best understand the Terms, and their several significations, so that herein we seem to instruct those that are best able to teach us, which might be true if they all spake the same language, but there is such a Babel of confusion as well in their Terms and Names of things, as there is in the practice of the Art of Agriculture it self, that remove a Husbandman but sixty, or an hundred Miles from the place where he hath constantly exercised his Husbandry, to another, and he shall not onely admire their Meihod and Order in Tilling the Land, but also at their strange and uncouth Language and Terms, by which they name their several Utensils, Instruments, or Materials they use; Also our several Authors that have written of this Subject, very much differ in the Appellation of several things, they generally speaking in their Writings, the Language of the Place and Age they lived in, that their Books read in another part of the Country, or in succeeding Times, seem either fabulous or intricate; wherefore that our Authors, and this present Tract, may be the better understood, and also that one Countrey-man may understand what another means in a remote place, I have here given you the Interpretation, and Signification of such Words and Terms that I remember I have either read or heard, which I hope may satisfie, and supply that defect of such a Dictionary that hath been so long complained of. If any Terms are wanting, or not rightly interpreted, I desire you to consider the place you live in, where perhaps may be some Terms used, or so interpreted, that are not so in any other place of England, which may I hope sufficiently excuse my ignorance of them; Or else they may be Terms so universally understood, that they need no interpretation, as Wheat, Rye, Cart, Waggon, &c.



DICTIONARIUM RUSTICUM;

O R,

*The Interpretations and Significations of several
Rustick Terms, &c.*

A

A *Ancs*, or *Awnes*, the Spires or Beards of Barley, or other Bearded Grain.

Ablatation is one of the ways of Grafting, that is, weaning the Cion by degrees from its Mother, being not wholly to be cut there-from, till it be firmly united to the Stock, on which it is grafted.

Ablaqueation is the taking away the Earth, or uncovering the Roots of Trees.

An *Acre* is one hundred and sixty square Lug, or Perch of Land, at sixteen foot and a half to the Perch; but of Coppice Wood eighteen foot to the Perch is the usual Allowance.

An *Adds* is a sharp Tool made different from an Ax, and more convenient for the cutting of the hollow side of any Board or Timber, such as the Coopers generally make use of.

Agricuture, the Tilling or Improving of Land.

Alveary, a Hive of Bees.

Apiary, a Place or Court where Bees are kept.

An *Aquaduct*, a Water-course, or Carriage for Water.

Aquaticks, Plants delighting in the Water.

Arders, Fallowings, or Ploughings of Ground.

Aromaticks, Plants odoriferous, or having a Spicy smell.

Avenues, Ways or Passages, or Rows or Walks of Trees.

Aviary, a place where Birds are kept, or do resort unto.

Axletree, or *Axis*, that which the Wheel of a Cart, or such like, moveth on.

B

B *Ag*, the Udder of a Cow, in some places is called the *Cows Bag*.

Balks, Ridges or Banks.

Barth, a warm Place or Pasture for Calves, or Lambs, &c.

Barrow, is of two sorts, either a *Hand-barrow*, or a *Wheel-barrow*.

Barton, a Back-side.

Baven, Brush-faggots, made with the Brush at length.

Beefstings, the first Milk from the Cow after Calving.

Beetle, or *Boyle*, a Wooden Instrument wherewith they drive Wedges, Piles, Stakes, &c.

Beverage, Drink, or mingled Drink.

A *Bill*, is an Edge-tool at the end of a stale or handle; if short, then it is called a *Hand-bill*; if long, then a *Hedging-bill*.

A *Binn*, a place made of Boards to put Corn in.

Blast, Corn is said to be blasted when it poor and thin in the Ear, with little Flower in it.

Blight. See *Mildew*.

Blith, Yielding Milk.

Bole, or *Boale*, the main body of a Tree.

Boot, necessary Timber or Wood for necessary uses, as *Plough-boot*, *House-boot*, *Fire-boot*, &c.

Boreas, the North-east Winde.

Bow, an Ox-bow, or Yoak.

Bragget, a Drink made with Honey and Spice, much used in *Wales*.

Brake, Fern.

Brank, *Buck*, or *French-wheat*, a Summer Grain, delighting in warm Land.

A *Breast-plough*, a sort of Plough driven by main force with ones breast, commonly used in paring the Turf in burn-baiting.

A *Breck*, or *Brack*, a Gap in a Hedge.

Brimme, a Sow is said to go to *Brimme* when she goes to the Boar.

To *Erite*, or *bright*, Hops are said to *Erite* when they are over-ripe, and shatter.

Browse, or *bronce*, the Tops of the Branches of Trees that Cattel usually feed on.

To *Burn-bait*, or *burn the Bait*. Vide *Denfbire*.

Bulchin, a Calf.

Bullimony, a Mixture of several sorts of Grain.

Bushel, in some places it is taken for two Strike, or two Bushels.

C

A *Cartwright*, one that makes Carts, Waggon, &c.

To *Cave*, or *Chave*, is with a large Rake, or such like Instrument, to divide the greater from the lesser, as the larger Chaff from the Corn, or smaller Chaff; Also larger Coals from the lesser.

Ceres, the Goddess of Corn, Seeds, and Tillage; Also the Title of one of the Books of Mr. *Rea*, treating of Seeds.

Chaff, the Refuse or Dust in winnowing of Corn.

Champion Lands not inclosed, or large Fields, Downs, or Places without Woods or Hedges.

Cheese-lip, the Bag wherein Housewives prepare and keep their Runnet, or Rennet for their Cheese.

Chitting,

Chitting, the Seed is said to chit when it shoots first its small Root in the Earth.

A *Ciderist*, One that deals in Cider, or an affector of Cider.

Clogs, Pieces of Wood, or such like, fastened about the necks, or to the legs of Beasts, that they run not away.

A *Cock*, is of Hay or Corn laid on heaps to preserve it against the extremities of the weather.

Codware, Such Seed or Grain that is contained in Cods, as Pease, Beans, &c.

A *Colefire*, Is a parcel of Fire-wood set up for sale or use, containing when it is burnt a Load of Coals.

Collers about the Catrels Necks, by the strength whereof they draw.

Come, The small fibres, or tayls of Malt.

Compass, or *Compost*, Soyl for Land, Trees, &c.

Coniferous Trees, are such that bears Cones or Clogs, as the Fir, Pine, &c.

A *Conservatory*, A place to keep Plants, Fruits, &c. in.

A *Cooze*, Four Bushels.

Coppice, *Copise*, or *Copse*, The smaller sort of Wood, or *Under-wood*.

A *Cord* of Wood is set out as the Colefire, and contains by measure four foot in breadth, four foot in height, and eight foot in length.

Covert, A shady place for Beasts.

A *Cradle*, Is a Frame of Wood fixed to a Sythe for the mowing of Corn, and causes it to be laid the better in Swarth, and it is then called a *Cradle-Sythe*.

A *Cratch*, A Rack for Hay or Straw. Vide *Rack*.

A *Croft*, A small Enclosure.

Crones, Old Eaws.

A *Crotch*, The forked part of a Tree, useful in many cases of Husbandry.

A *Crow*, or *Crome* of Iron, An Iron Bar with one end flat.

To *Cultivate*, To Till.

Culture, Tilling.

A *Curey-Comb*, An Iron Comb wherewith they kemb Horses.

A *Cyon*, A young Tree or Slip, springing from an old.

D

D *Allops*, A Term used in some places for Patches, or Corners of Grass or Weeds among the Corn.

Darnel, Cockleweed, injurious to Corn.

To *Densfire*, is to cut off the Turf of Land, and when it is dry to lay it on heaps and burn it.

To *Delve*, To Dig.

A *Dibble*, An Instrument wherewith they make holes for the setting of Beans, &c.

A *Dike*, A Ditch.

Dredge,

Dredge, Oats and Barley mixed.

Drought, A long time of dry weather.

Dugg of a Cow, that is, the Cows Tet.

A *Dung-fork* is a Tool of three Tines or Pikes, for the better casting of Dung.

E

TO *Ear* or *Are*, To Plough or Fallow.

Earning, Runnet wherewith they convert Milk into Cheese.
Eadish, *Eadish*, *Eich*, or *Eegrass*, the latter Pasture or Grass that comes after Mowing or Reaping.

To *Edge*, To harrow.

Edifice, Building.

Egiments, Cattel taken into graze, or be fed by the week or moneth.

Espaliers, Trees planted in a curious order against a Frame for the bounding of Walks, Borders, &c.

Exoticks, Foreign Plants, not growing naturally in our English Soyl.

F

TO *Fallow*, To prepare Land by ploughing, long before it be ploughed for Seed. Thus may you fallow, twifallow, and trifallow, that is, once, twice, or thrice plough it before the Seed-time.

A *Fann*, is an Instrument that by its motion artificially causeth Winde, useful in the winnowing of Corn.

A *Farding Land*, or *Farundale of Land*, is the fourth part of an Acre.

A *Fathome* of Wood, is a parcel of Wood set out, six whereof make a Colefire.

To *Faulter*, Thrashers are said to faulter, when they thrash or beat over the Corn again.

To *Ferment*, that is, to cause Beer, Cider, or other Drinks to work, that the Dregs or Impurities may be separated upwards or downwards.

Fermentation, such working.

Fertile, Fruitful.

Fertility, Fruitfulness.

Fetters are usually made of Iron, and hanged about the legs of Cattel, that they leap not, or run away.

Fewel, Any combustible matter wherewith a fire is made.

Filly, A She-colt.

Fimble Hemp, that is the yellow early Hemp.

Flayl, A Thrashing Instrument.

Floating, or drowning, or watering of Meadows, Also *Floating* of a Cheese, is the separating the Whey from the Curd.

Flora,

Flora, The Goddess of Flowers; also the Title of Mr. *Rea* his excellent Treatise of Flowers.

Fodder, Hay, Straw, or such like Food for Cattel.

Foison, Plenty of Riches.

Foisty, Musty.

Fork, There are several sorts of them, some of Wood, some of Iron; some for Hay, others for Corn, &c.

To *Fowl*, That is to Fallow Land in the Summer, or Autumn.

Fragrant, Smelling pleasantly.

Friish, Underwood, or the shroud of Trees.

A *Frower*, An Edge-tool used in cleaving Lath.

Furrow, The low Fall, or Drain in Land, either left by the Plough, or otherwise made,

G

A *Gap*, An open place in a Hedge, or such like.

A *Garner*, A Granary to put Corn in.

Georgicks, Belonging to Husbandry, or Tillage, as *Virgil's Georgicks*, his Books of Husbandry.

Germination, A budding forth.

Glandiferous, Bearing Mast.

To *Glean*, To pick up or gather the shattered Corn.

A *Goad*, A small Staff, or Rod with a sharp Iron-pin at the end thereof, to quicken Horses or Oxen in their motion.

A *Goff*, or *Goffe*, A Mowe or Reek of Corn.

To *Gore*, To make up such Mowes or Reeks.

Goss, or *Gorse*, Furzes.

Groat, Oats after the Hulls are off, or great Oatmeal.

Grubbage. See Mattock.

H

To *Hale*, or *Hawl*, To draw.

Harnes, Ropes, Collers, and other Accoutrements fitted to Horses or other Beasts, for their drawing.

Hatches, Flood-gates placed in the Water to obstruct its Current.

Haws, The Fruit of the White-thorn.

Hawm, The stalks of Pease, Beans, or such like.

Head-land, That which is ploughed overthwart at the ends of the other Lands.

Heckle, An Instrument used in the trimming and perfecting of Hemp and Flax for the Spinner, by dividing the Tow or Hurds from the Tare.

Helm, is Wheat or Rye straw unbruised by thrashing or otherwise, and bound in bundles for thatching.

Hips, The Fruit of the Black-thorn.

Herbage, The Feeding, Grazing, or Mowing of Land.

Hide-

Hide-bound, A Disease whereunto Trees as well as Cattel are subject.

A Hinde, A Servant in Husbandry.

Hillock, A little Hill, as a Hop-hill, &c.

Hogs, In some places Swine are so called, in some places young Weathers.

Hook, Land tilled and sown every year.

Hopper, Wherein they carry their Seed-Corn at the time of sowing; Also the Vessel that contains the Corn at the top of the Mill.

How, An Instrument made like a Coopers Adds, for the cutting up of Weeds in Gardens, Fields, &c. and between Beanes, Pease, &c.

Hovel, A mean building or hole for any ordinary use.

Hoven, Cheese that is raised or swelled up.

Hull, or *Hulls*, the Chaff of Corn.

Hurds of Flax or Hemp, are the worser parts separated from the Tare in the Heckling of it, whereby may be made Linnen Cloath.

Hutch, A Vessel or Place to lay Grain, or such like thing in; Also a Trap made hollow for the taking of Weasels, or such like Vermine alive.

Hut, A small Hovel, or Cottage.

I

A *Jack*, A term sometimes used for a Horse whereon they sawe Wood.

Iles, or *Oiles*. Vide *Aanes*.

An *Imp*, a young Tree.

Infertile, Barren.

Inoculation, The Grafting or placing of the Bud of one Tree, into the Stock or Branch of another.

Irrigation, Watering of a Meadow, Garden, &c.

Irroration, A bedewing or besprinkling of a Plant.

Junames, That is Land sown with the same Grain it was sown with the precedent year.

Juter, A term by some used, for the fertile coagulating saltish nature of the Earth.

K

K *Arle Hemp*, That is, the latter green Hemp.

Kell, or *Kiln*, whereon they dry Malt or Hops.

L

L *Alary*, A Dairy-house.

Laire, *Layer*, or *Licare*, Places where Cattel usually repose them-

themselves under some shelter, the Ground being enriched by their Soyl.

A *Lath*, A Barn.

Laund, or *Lawne* in a Park, plain and untilld Ground.

To *Lease*, or *Leaze*. Vide to *Glean*.

Lentils, A sort of Grain less than Fitches.

Litter, Straw, or such like stuff for Cattel to lodge on.

To *Lock*, is a term used by Drivers in moving the Fore-wheels of a Waggon to and fro,

Log, A term used in some places for a Cleft of Wood, in some places for a long Piece or Pole, by some for a small Wand or Switch.

To *Lop*, To cut off the head branches of a Tree.

A *Lug*. Vide *Perch*.

Lynchet, A certain line of Green-sword or Bounds, dividing Arable Land in Common Fields.

M

M *Adds*, A Disease in Sheep.

Manger, The place wherein Beasts eat Corn, or other short Meat.

A *Mash*, or *Mesh*, Ground Corn, or such like, boyled in water for Cattel to eat.

Mast, The Fruits of wilde Trees, as of Oaks, Beech, &c.

Mattock, A Tool wherewith they grub Roots of Trees, Weeds, &c. by some called a *Grub-axe*, or *Rooting-axe*.

Mature, Ripe.

A *Mayn-Comb*, wherewith they kemb Horses Mayns.

A *Meak*, wherewith they mow or hack Pease, or Brake, &c.

Mere, The same as *Lynchet*.

Mildew, A certain Dew, falling in the moneths of *June* and *July*, which being of a viscous nature, much impedes the growth or maturation of Wheat, Hops, &c. unless a shower of Rain wash it off; It is also very sweet, as appears by the Bees so mightily enriching their stores thereby.

Missen, or *Massen*, Corn mixed, as Wheat with Rye, &c.

Mogshade, The shadows of Trees, or such like.

Mold, Earth.

Mounds, Banks, or Bounds.

Muck, Dung, or Soyl.

Must, The new Liquor or Pressure of Fruits, before fermentation.

N

N *East*, A Heifer, or any of the kinde of Beeves.

A *Neat-herd*, A Keeper of Neat, Beeves, or Cows.

A *Nursery*, A Place set apart for the raising of young Trees, or Stocks.

O

Ollet, Fewel.

Olitory, An **Olitory** Garden is a Kitchen Garden, or a Garden of Herbs, Roots, &c. for food.

Ost, **Oost**, or **Eest**, the same as **Kell**, or **Kiln**.

P

A **Paddle-staff**, A long Staff with an Iron Bit at the end thereof, like a small Spade, much used by Mole-catchers.

A Payl, The same as a Bucket.

Pallisade, A sort of slight open Pale or Fence, set to beautifie a Place, or Walk.

Palms, The white Excrescencies of Buds of Sallyes or Withy, coming before the Leaf.

Pannage, The feeding of Swine or other Cattel on the Mast, or other Herbage, in Forrests, Woods, &c.

A Pannel, **Pad**, or **Pack-saddle**, Kinds of Saddles whereon they carry Burthens on horse-back.

Parterre, or **Partir**, A name proper to a Garden divided into Beds, Walks, and Borders, for curious Flowers, Herbs, &c.

Pease-bolt, **Pease-hawm**, or **Straw**.

Pedware, **Pulse**.

Penstocks, See **Hatches**.

A Perch, or **Lug**, is sixteen foot and a half Land-measure, but is usually eighteen foot to measure Coppice Woods withal.

A Pike, A Fork or Prong of Iron.

A Pile, A parcel of Wood, two whereof make one Colefire.

A Piscary, A Liberty of Fishing, or a place where Fishes are confined.

A Pitch-fork, or **Pick-fork**, the same with **Pike**.

A Plough, A Term used in the Western parts for a Team of Horse or Oxen.

A Plough-wright, One that makes Ploughs.

Podds, The Cods or Shells of Cod-ware, or any other Seed.

Pollard, or **Pollinger**, An old Tree usually lopped.

To Polt, To beat or thrash.

Pomona, The Goddess of Fruits; Also the Title of several Treatises of Fruit-trees.

Pregnant, Full as a Bud, or Seed, or Kernel, ready to sprout.

A Frong, The same as **Pike**.

To Propagate, To encrease or multiply any thing.

A Propagator, A Planter.

To Prune, To trim Trees, by cutting off the superfluous Branches or Roots.

Puckers, Nests of Caterpillars, or such like Vermin.

A Paddock, or **Purrock**, A small Enclosure.

Q

Q *Quincunx*, Is an order of planting Trees or Plants, that may be in order every way.

R

A *Rack*, A place made to contain Hay, or other Fodder, for Beasts to feed on.

To Ree, or Ray, To handle Corn in a Sieve, so as the chaffy, or lighter part gather to one place.

Reed, is either the long Grass that grows in Fenns, or watery Places, or Straw bound up for thatching, by some called *Helm*. See *Helm*.

A *Reck* of Corn, a Mow or Heap of Corn, so laid for its preservation, out of any Barn.

A *Reck-staval*, A Frame of Wood placed on stones, on which such Mow is raised.

Resnaceous, Rosenny, or yielding Rosin.

Rice, The Shrouds or Tops of Trees, or Fellings of Coppices.

A *Ride* of Hazel, or such like Wood, is a whole plump of Sprigs, or Frith, growing out of the same Root.

The *Ridge*, The upper edge of a Bank, or other rising Land.

A *Rock*, An Instrument generally used in some parts for the spinning of Flax or Hemp.

A *Rodd*. See *Perch*.

A *Roller*, wherewith they roll Barley, or other Grain.

A *Rood*, A fourth part of an Acre.

Rough, The Rough Coppice Wood, or Brushy Wood.

Rowen, Rough Pasture full of Stubble or Weeds.

Rudder, or Ridder, The widest sort of Sieves for the separating the Corn from the Chaff.

Runnet, A certain sower matter, made use of by Countrey Housewives for the coming (or coagulation) of their Cheese.

Rural, Of, or belonging to the Countrey.

Rusticities, Countrey affairs.

Rustick, Countrey-like.

S

A *Seed-lop, or Seed-lip*, The Hopper, or Vessel wherein they carry their Seed at the time of Sowing.

A *Seminary*, A place where you sow Seeds in for the raising of Trees, or Plants.

To Sew, To drain Ponds, Ditches, &c.

Shake-time, The season of the year that Mast and such Fruits, fall from Trees.

- A *Shedd*, A place erected and covered over for shelter for Cattel, or any other use, against a Wall, or other Edifice.
- To *Sheer*, is used in the Northern parts for to Reap.
- Shock*, Several Sheaves of Corn set together.
- A *Sbrape*, or *Scrape*, A place baited with Chaff, or Corn, to entice Birds.
- To *Shroud*, To cut off the head branches of a Tree.
- A *Sickle*, A toothed Reap-hook.
- A *Site*, A principal Mannor, or Farm-house.
- A *Skepe*, or *Scuttel*, A flat and broad Basket, made to carry Corn withal.
- A *Skreyn* is an Instrument made of *Wyer* on a Frame, for the dividing of Corn from *Dust*, *Cockle*, *Ray*, &c. Also it is usually made of *Lath* for the skreyning of *Earth*, *Sand*, *Gravel*, &c.
- Slabb*, The out-side sappy Plank or Board sawn off from the sides Timber.
- A *Sledd*, A thing without Wheels, whereon to lay a Plough, or other ponderous thing, to be drawn.
- A *Sluce*, A Vent, or Drain for Water.
- Sneed*, or *Snead*, The handle of a Sythe, or such like Tool.
- Soufe*, The Offal of Swine.
- Sontage*, Course Cloath, or Bagging for Hops, or such like.
- A *Spade*, or *Spitter*, wherewith they dig or delve; also a *Cutting Spade* wherewith they cut *Hay* or *Corn-Mowes*.
- Stack* of Corn. See *Reek*.
- staddles*, *Standils*, or *Standards*, Trees reserved at the Felling of Woods, for growth for Timber.
- Stail*, The Handle of a Tool.
- Stercoration*, Dunging.
- Sterile*, Barren.
- Stover*, Straw.
- A *Strike* of Flax so much as is Heckled at one handful; Also it signifies an Instrument wherewith they strike Corn in the measuring. Also it is used in the Northern parts for a Measure containing about a Bushel.
- Strutwres*, Buildings.
- A *Sturk*, A young Beeve, or Heifer.
- A *Sty*, A place for fattening, or keeping Swine.
- Succulation*, A pruning of Trees.
- Succulent*, Juicy.
- A *Sull*, A term used for a *Plough* in the Western parts.
- A *Sull-paddle*, A small Spade-staff or Instrument to cleanse the Plough from the clogging Earth.
- To *Summer-fir*, To fallow Land in the Summer.
- A *Suffingle*, A large Girt that Carriers use to binde or fasten their Packs withal.
- Sward*, Ground is said to have a *sward*, or to be swarded, when it is well grown or coated over with Grass, or other Vegetables.

Swath, or *Swarth*, Grass, Corn, or such like, as it is laid by the Mower from the Sythe.
Swill, Used in the Northern parts for shade, or shadow.
To Swingle Flax, a Term used by Flax-dressers.
A Swine-herd, A Keeper of Swine.
A Sythe, wherewith they mow Grass, or Corn.

T

T*Are* of Flax, the finest drest part thereof ready for the Spinner.
Tares, A sort of Grain.
To Tedd, To turn or spread New mown Grass.
A Team, or *Team*, A certain number of Horses, or other Beasts, for the Draught.
Terrasse, A Walk on a Bank or Bulwark.
Tett, The Cows Dug by some is called the *Tett*.
A Thrave of Corn contains four Shocks, each Shock consisting of six Sheaves.
A Tike, A small Bullock, or Heifer.
Tills, Lentils, a sort of Pulse.
Tylth, Soyl, or other Improvement of Land.
The Tine, or Grayn of a Fork.
Tits, Small Cattel.
A Trendle, A flat Vessel, by some called a *Kiver*.
A Trough, A Vessel to hold water, &c. to feed Cattel in, &c. or for the beating of Apples for Cider, or the like.
A Trundle, A thing made and set on low Wheels to draw heavy burdens on.
A Trunchion, a Piece of Wood cut short like a Quarter-staff.
A Tumbrel, A Dung-cart.

V

A*Vat*, A Vessel to contain Beer, Ale, Cider, or any other Liquor in its preparation.
Vindemiation, The gathering of Grapes, or reaping the Fruit of any thing, as of Cherries, Apples, Bees, &c.
To Vindemiate, To gather the same Fruits.
Vinous, Winy.
Underwood, Coppice, or any other Wood that is not esteemed Timber.
Urry, The blew Clay that is digged out of the Coal-mines, and lyes next the Coal, being crude and immature, and used for foyling of Land.
Utensils, Instruments used in any Art, especially Husbandry.

Dictionarium Rusticum.

W

A *Wantey.* Vide Suffingle.

A *Weanel,* A young Beast newly weaned.

Whinnes, Furzes.

A *Wind-row,* Hay or Grass raked in Rows, in order to be set up in Cocks.

To *Winnow,* To separate by Winde the Corn from the Chaff.

To *Winter-rigg,* To fallow Land in the Winter.

Wood-land, Places where much Woods are; or its generally taken for Countreys enclosed.

Y

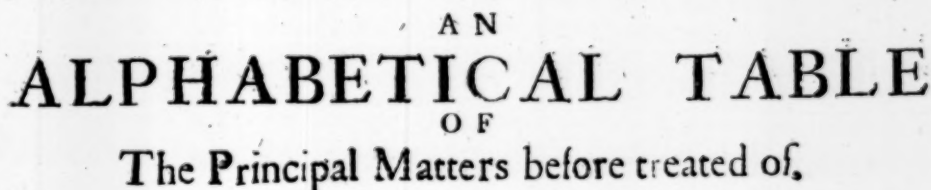
A *Yate,* or *Yatt,* A Gate.

A *Yoaik,* is either an Instrument for Oxen to draw by, or to put on Swine or other unruly Creatures, to keep them from running through Hedges.

Z

Z *Ephyrus,* The West-winde.

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